4.14 Water Resources

The water resources section addresses potential impacts of the Proposed Project to water quality as a result of sanitary sewer capacity and wastewater production and disposal. Insufficient sewer capacity could ultimately result in adverse water quality impacts to surface waters and/or the ocean, at the point of effluent discharge. Similarly, wastewater disposal associated with oil and gas drilling could result in adverse water quality impacts to surface waters and groundwater. See Section 4.9, Hydrology and Water Quality, for water quality impacts not related to disposal of wastewater. In addition, this section addresses potential water demand and supply issues associated with the Proposed Project.

4.14.1 Environmental Setting

4.14.1.1 Sanitary Sewer Wastewater

The City of Hermosa Beach provides wastewater collection and treatment services within city limits. The sanitary sewer system network is comprised of approximately 37 miles of sewer lines. Much of the system is believed to have been installed in the late 1920s, although confirmation of this is difficult. The majority of the original system is concrete, with recent replacements of clay pipe. The system is primarily a gravity flow system, with the exception of two pump stations. The effluent collected by sewer lines, ranging in size from 6 to 24 inches in diameter, is discharged into the Sanitation Districts of Los Angeles County trunk lines, which flow in a north-northwesterly direction toward the City of Manhattan Beach (MBF Consulting, Inc. 2011).

The Sanitation Districts of Los Angeles County trunk lines flow to a Joint Water Pollution Control Plant (JWPCP), located in the City of Carson. The JWPCP is one of the largest wastewater plants in the world and is the largest of the Sanitation Districts of Los Angeles County wastewater treatment plants. The facility provides both primary and secondary treatment for approximately 280 million gallons of wastewater per day and has a total permitted capacity of 400 million gallons per day. The plant serves a population of approximately 3.5 million people throughout Los Angeles County. Treated discharge from the plant is transported to the Pacific Ocean through a network of outfalls, which extend 1.5 miles off the Palos Verdes Peninsula, to a depth of 200 feet (Sanitation Districts of Los Angeles County 2013).

4.14.1.2 Water Supply

Potable water is provided to the City by the California Water Service Company (Cal Water). Formed in 1926, the San Jose-based Cal Water serves more than 472,000 customers through 28 Customer and Operations Centers throughout the state. Cal Water is the largest subsidiary of the California Water Service Group, which also includes Washington Water Service Company, New Mexico Water Service Company, Hawaii Water Service Company, HWS Utility Services, and CWS Utility Services. As a whole, the group provides regulated and non-regulated utility

services to approximately two million people in 100 communities. About 95 percent of Cal Water's business is regulated by State utilities commissions (Cal Water 2013).

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. Historically, West Basin's primary supply source was imported water from Metropolitan Water District of Southern California. West Basin purchases water from the Metropolitan Water District and wholesales the water to cities and private companies in southwest Los Angeles County. However, given recent concerns over future reliability of these imported supplies, West Basin has been increasing its development of local supplies. Groundwater production within the West Basin service area includes the West Coast Groundwater Basin and pumping from the Central Groundwater Basin into the West Basin service area. West Basin is projecting to more than double current recycled water supplies by 2035, as well as invest in over 20,000 acre-feet per year (AFY) of ocean water desalination supply. These sources, coupled with an additional doubling of conserved supply through water use efficiency programs, are expected to cut the overall imported water use nearly in half from 2008 to 2020. West Basin's service area uses 220,000 acre-feet of water annually. An acre-foot of water is approximately 326,000 gallons, which is enough to meet the water needs of two average families in and around their homes for one year (West Basin 2011a, 2011b).

4.14.1.3 Surface Runoff

Project Site

The Project Site generally drains to the west, toward an existing storm drain inlet. A small portion of the 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).

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 an existing storm drain inlet and the Pacific Ocean. The property is fully developed and similarly surrounded by urban development.

Pipeline Route

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 Torrance 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.

4.14.1.4 Groundwater

The Project Site is located along the westerly edge of the West Coast Basin, which is bound on the west and south by the Pacific Ocean, on the north by the Ballona Escarpment, and on the east by the Newport-Inglewood Fault Zone. 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 Aquifer), the Silverado Aquifer, and the Lower San Pedro/Pico Aquifer. Groundwater depths in these predominantly confined aquifers reaches more than 1,500 feet in the West Coast Basin, although production wells generally are not this deep (California Department of Water Resources 1961, Cal Water 2011).

Most of the groundwater in the West Coast Basin remains at an elevation below sea level due to historic over-pumping; therefore, seawater intrusion barriers have been established. Groundwater in this basin is primarily recharged through injection wells that comprise the seawater intrusion barriers, which include the Dominguez Gap Barrier, designed to prevent intrusion from San Pedro Bay, and the West Coast Basin Barrier Project, designed to prevent intrusion from the Pacific Ocean. However, inflows also come from imported and recycled water purchased by the Water Replenishment District of Southern California, areal recharge from precipitation falling on the basin floor, and groundwater underflow from adjacent basins (Water Replenishment District of Southern California 2007, Cal Water 2011).

There are no domestic water supply wells located in the vicinity of the Project Site. However, there is at least one nearby well that pumps water for on-site industrial water. This pumping counteracts the inflow from the seawater intrusion barriers (Cal Water 2011).

4.14.2 Regulatory Setting

4.14.2.1 Federal Regulations and Policies

Safe Drinking Water Act of 1974

The Safe Drinking Water Act of 1974 was implemented by the Environmental Protection Agency (EPA) and is the primary federal regulation controlling drinking water quality in every public water system in the United States. The Safe Drinking Water Act authorized the EPA to establish and enforce guidelines for drinking water to protect against both naturally occurring and manmade contaminants.

The Safe Drinking Water Act was originally implemented in 1974 with significant amendments in 1986 and 1996. The Safe Drinking Water Act originally set standards for the treatment of individual constituents, including pesticides, trihalomethanes, arsenic, selenium, radionuclides, nitrates, toxic metals, bacteria, viruses, and pathogens. The amendments to the Safe Drinking Water Act made some significant changes, most of which resulted in more stringent protection of

drinking water sources. The amended Safe Drinking Water Act also greatly enhanced the existing law by implementing operator training, funding for water system improvements, and public information as important components of safe drinking water.

4.14.2.2 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 primary 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 the 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.

In 2006, the SWRCB adopted Order Number 2006-003 that established General Waste Discharge Requirements for all publicly owned or operated sanitary sewer systems within the State of California. The Waste Discharge Requirements require owners and operators of sewer collection systems to report sanitary sewer overflows in the California Integrated Water Quality System and to develop and implement a Sewer System Management Plan. The Sewer System Management Plan details sewer collection system operations, maintenance, repair, and funding.

The Porter-Cologne Water Quality Control Act of 1987

The Porter-Cologne Water Quality Control Act governs water quality in California by assigning the overall responsibility for water rights and water quality protection to the SWRCB to develop and enforce water quality standards. The EPA delegated to California the authority to issue NPDES permits for all areas within its boundaries, except Native American territories.

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 Oil Field Waste (CCR, Title 23, Chapter 3, Subchapter 15, Articles 3 and 5)

Oil field waste materials, including but not limited to drilling muds, oily wastes, and brines, generally contain toxic substances and materials that could significantly impair the quality of usable waters and generally constitute Group I wastes. Such waste, which is ordinarily deposited at Class I or Class II-1 disposal sites, may be disposed by other means if such operations do not unreasonably affect water quality because of the type of waste and disposal operation, or an

operation is in compliance with ordinances or regulations of other governmental agencies which adequately protect water quality. In 1980, Congress added section 1425 to the Safe Drinking Water Act, which controls underground injection of waste, giving the states the authority to demonstrate that they maintain an effective program to prevent underground injection which endangers drinking water sources. The Los Angeles Regional Water Quality Control Board authorizes such disposal options.

Safe Drinking Water and Toxic Enforcement Act of 1986

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 to be authoritative by the state's qualified experts, such as the EPA or Food and Drug Administration, formally identifies the chemical as causing cancer or reproductive toxicity. A chemical can also be listed if a state or federal agency has formally required labeling or identifying of that chemical as causing cancer or reproductive toxicity. The criteria for the listing these chemicals are outlined in California Code of Regulations, Title 27, Section 25306.

Groundwater Management Act of 1992

The Groundwater Management Act, commonly referred to as Assembly Bill (AB) 3030, is designed to provide local public agencies with increased management authority over groundwater resources. Groundwater is a valuable natural resource within California, and AB 3030 ensures safe production and quality by encouraging local agencies to work cooperatively to manage groundwater resources within their jurisdictions (Water Code Section 10750).

Senate Bill 610, Water Supply Assessment

Senate Bill (SB) 610 was passed on January 1, 2002, amending California law to require detailed analysis of water supply availability for large development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensuring that land use decisions for certain large development projects are fully informed as to whether sufficient water supplies are available to meet project demands. The lead agency for the project is required to identify the public water system that might supply water to the project and then to request a Water Supply Assessment from the water supplier. If there is no public water system and the project meets the definition of “project” as defined in SB 610, then the lead agency must prepare the assessment. As indicated in Impact WR.4 below, a Water Supply Assessment would not be required for the Proposed Project.

4.14.2.3 Local Policies and Regulations

County of Los Angeles

The Sanitation Districts of Los Angeles County serves approximately 5.7 million people in Los Angeles County through 24 independent special districts. The service area includes approximately 820 square miles in 78 cities and unincorporated areas within the county. Approximately 1,400 miles of main trunk sewers and 11 wastewater treatment facilities serve the area. The 23 independent special districts are governed by Boards of Directors, consisting of the mayors of each city within the Districts and the Chair of the Board of Supervisors for

unincorporated territories. The City of Hermosa Beach lies within the South Bay Cities District of the Sanitation Districts of Los Angeles County.

City of Hermosa Beach

The City of Hermosa Beach is the current owner of the Existing City Maintenance Yard. The Community Development Department is charged with the administration of the ordinances and policies relating to land use and development within the City. In addition, the City Public Works Department adopts and administers engineering standards and permits required for new construction projects.

4.14.3 Significance Criteria

Wastewater impacts would be deemed significant if the Proposed Project would:

- Exceed wastewater treatment requirements of the applicable RWQCB;
- Exceed the capacity of the existing sanitary sewer system or treatment plant that serves the project site, thereby requiring new or expanded facilities that would cause a substantial physical adverse change in the environment;
- Adversely affect the existing wastewater service provider or the existing wastewater facilities by exceeding current and future demands and capacity; or
- Substantially degrade the quality of surface water or groundwater.

With regard to water supply, the Proposed Project would have a significant environmental impact on the water supply if it:

- Substantially depletes water supplies.
- Requires new off-site water supply (i.e., water not derived from an on-site well or surface water impound) or distributions facilities or expansion of existing facilities, the construction of which would cause substantial adverse physical change in the environment.
- Requires new or expanded water entitlements.

4.14.4 Project Impacts and Mitigation Measures

4.14.4.1 Introduction

The Proposed Project would result in wastewater generation that could potentially impact surface water quality, groundwater quality, and marine water quality. Wastewater would be generated by construction and operational personnel at the Proposed City Maintenance Yard Project, by construction personnel at the Project Site during Phase 1 and 3, as well as by operational personnel at the Project Site during Phases 2 and 4. In addition, the Proposed Oil Project would require new off-site water supplies at the Project Site for Phase 1 and 3 construction, as well as Phase 2 and 4 operations, with well drilling requiring the most water. However, these actions would not substantially deplete water supplies or require new or expanded water entitlements.

4.14.4.2 Proposed Project Design Features

Sanitary Wastewater

During Phase I, portable toilets would be used for the 93 construction personnel at the Project Site. During Phase 2, a temporary construction trailer and associated restrooms would be installed in the northeast portion of the Project Site. The sewer lateral that serves the Existing City Maintenance Yard would be extended to the construction trailer, for 84 personnel for an estimated 12 month period. In the event that Phase 3 is completed, the same sewer lateral would be used by a 650 square foot office building and associated restrooms to be constructed onsite, for 181 personnel for an estimated 14 month period. These restrooms would continue to be used during Phase 4, for 86 personnel over a 30 to 35 year period.

Oil Reservoir Wastewater

During Phase 2, water would be separated from the oil and gas stream by a three-phase separator. The water would then be pumped into a treatment system to remove excess oil, including a gas flotation unit and a filter unit. The primary objective of these units would be to clean the water of oil and solids, such as sand. In addition, the extracted water would be tested for sulfate-reducing bacteria (SRB) and treated by a biocide if SRB is detected. Replacement water would similarly be tested and treated, as necessary. SRBs are an assemblage of specialized bacteria that thrive in the absence of oxygen and obtain energy for growth by oxidation of organic nutrients, with sulfate being reduced to hydrogen sulfide (H_2S). SRB treatment could be a batch or continuous treatment. There are numerous antibacterial agents available on the market that could be used for this specific treatment if it is determined to be needed.

Upon exiting the filter unit, the water would enter a water surge tank and then be sent to the water injection pumps for injection into the oil-producing reservoir, through an injection well. Operators would be onsite 24 hours per day, seven days per week, to monitor this oil/gas/water separation process.

As also discussed in Section 4.9, Hydrology and Water Quality, in the event of a spill during the water separation and wastewater injection process, runoff would be collected and pumped into the water processing system for injection into the oil reservoir. The Project Site would be designed to retain, process, and inject storm water within the perimeter fence or wall for a 100-year storm event. Similar to any precipitation, any spills on the Project Site would be contained, both within process system walls/berms around equipment and site walls/berms around the site. Process walls/berms would be designed to contain at least 110 percent of the largest vessel.

The injection wells would be designed to meet all of the rules and regulations of the California DOGGR. All of the injection wells would have steel casing that would be cemented in place. All of the produced water would be injected through injection tubing that would run down through the steel casing. The tubing would be placed in the well to a point just above the perforations, located at the zone of water injection, and a packer would be used near the bottom of the tubing to seal it against the casing. The packer prevents water from entering the space between the tubing and casing when water is injected down the tubing. Several tests are typically run to ensure that the well is operating properly and that the injected fluids are confined to the intended injection zone (DOGGR 2013).

Water Supply

During Phase 2, the water line currently located along 6th Street that serves the Existing City Maintenance Yard would be extended to the temporary construction trailer in the northeast portion of the Project Site. Domestic water demand, i.e., for drinking and restrooms, for Phases 2, 3, and 4 would be provided by Cal Water. Water supplies for drilling would be provided by West Basin, via extension of an existing water line serving the Greenbelt east of Valley Drive. The water district has provided the Applicant with a "will serve" letter, which is written verification of sufficient water supply, based on substantial evidence. Water demand for the Proposed City Maintenance Yard Project would be provided by Cal Water, the City's water purveyor.

4.14.4.3 Impacts

Impact WR.1 pertains to the following significance criteria:

Wastewater impacts would be deemed significant if the Proposed Project would:

- Exceed wastewater treatment requirements of the applicable RWQCB;
- Exceed the capacity of the existing sanitary sewer system or treatment plant that serves the Project Site, thereby requiring new or expanded facilities that would cause a substantial physical adverse change in the environment;
- Adversely affect the existing wastewater service provider or the existing wastewater facilities by exceeding current and future demands and capacity; or
- Substantially degrade the quality of surface water or groundwater.

Impact #	Impact Description	Phase	Residual Impact
WR.1	The Proposed Oil Project and the Proposed City Maintenance Yard Project would generate sanitary sewer wastewater that could exceed wastewater treatment requirements of the applicable RWQCB; exceed the existing capacity of downstream sewer and wastewater treatment facilities; or adversely affect the existing wastewater service provider or the existing wastewater facilities by exceeding current and future demands and capacity.	Phase 1, 2, 3, and 4	Class II Less Than Significant with Mitigation

Proposed City Maintenance Yard Project

During Phase I, the Existing City Maintenance Yard would be relocated to existing City-owned property, currently occupied by a self-storage facility located adjacent to Hermosa Beach City Hall. The number of employees at the proposed 48,000 square foot facility would be similar to the current number of employees at the Project Site. Although there would be no increase in wastewater production and associated impacts on the downstream Sanitation Districts of Los Angeles County Joint Water Pollution Control Plant, it is unclear whether the existing City sewer adjacent to City Hall has the capacity to support the increased sewage volume associated with the Proposed City Maintenance Yard Project. Overloading sanitary sewer systems can

ultimately result in releases of untreated sewage to surface waters, groundwater, and/or the ocean. Therefore, impacts are considered *potentially significant*.

Proposed Oil Project

As indicated in Section 4.14.4.2, Proposed Project Design Features, during Phase I, portable toilets would be used for the 26 construction personnel at the Project Site. During Phase 2, a temporary construction trailer and associated restrooms would be installed in the northeast portion of the Project Site. The sewer lateral that serves the Existing City Maintenance Yard would be extended to the construction trailer, for 20 personnel for an estimated 12 month period. In the event that Phase 3 is completed, the same sewer lateral would be used by a 650 square foot office building and associated restrooms to be constructed onsite, for 62 personnel for an estimated 14 month period. These restrooms would continue to be used during Phase 4, for 20 personnel over a 30 to 35 year period.

It is unclear whether the existing City sewer along 6th Street, as well as downstream Sanitation Districts of Los Angeles County sewer and wastewater treatment facilities, has the capacity to support the increased sewage volume associated with the Proposed Oil Project. Overloading sanitary sewer systems can ultimately result in releases of untreated sewage to surface waters and/or the ocean. Therefore, impacts are considered *potentially significant*.

Mitigation Measures

WR-1 Prior to approval of demolition and new construction, a Registered Civil Engineer in the State of California shall evaluate the capacity of the existing sewer line system, beginning at the proposed tie-ins on Valley Drive for the Proposed City Maintenance Yard Project and 6th Street for the Proposed Oil Project, and continuing downstream to the Sanitation Districts of Los Angeles County sewer system, prior to any connections. A 7-day capacity performance test shall be performed, based on Sanitation Districts of Los Angeles County average wastewater generation factors, to determine baseline and peak flows, and to ensure the sewer has adequate capacity in the downstream areas. The capacity analysis shall be submitted to the City Public Works Department and the Districts for review and approval.

In the event that existing sanitary sewer facilities are insufficient to accommodate increased flows from the Project Site, the Applicant shall provide mobile sanitary facilities (i.e., toilet, sink, and urinal) for onsite personnel, as necessary.

Residual Impacts

With implementation of measure WR.1, the proposed development would be considered **less than significant with mitigation (Class II)**.

Impact WR.2 pertains to the following significance criteria:

Wastewater impacts would be deemed significant if the Proposed Oil Project would:

Substantially degrade the quality of surface water or groundwater.

Impact #	Impact Description	Phase	Residual Impact
WR.2	The Proposed Oil Project would generate wastewater that could impact surface water quality and the Pacific Ocean.	Phase 2 and 4	Class II Less Than Significant with Mitigation

As indicated in Section 4.14.4.2, Proposed Project Design Features, during Phases 2 and 4 of the Proposed Oil Project, water would be separated from the oil and gas stream by a three-phase separator. The water would then be pumped into a treatment system to remove excess oil, including a gas flotation unit and a filter unit. The primary objective of these units would be to clean the water of oil and solids, such as sand. In addition, the extracted water would be tested for SRB and treated by a biocide if SRB is detected. Replacement water would similarly be tested and treated, as necessary. SRBs are an assemblage of specialized bacteria that thrive in the absence of oxygen and obtain energy for growth by oxidation of organic nutrients, with sulfate being reduced to H_2S. SRB treatment could be a batch or continuous treatment. There are numerous antibacterial agents available on the market that could be used for this specific treatment if it is determined to be needed.

Upon exiting the filter unit, the water would enter a water surge tank and then be sent to the water injection pumps for injection into the oil-producing reservoir, through an injection well. Operators would be onsite 24 hours per day, seven days per week, to monitor this oil/gas/water separation process.

As also discussed in Section 4.9, Hydrology and Water Quality, in the event of a spill during the water separation and wastewater injection process, runoff would be collected and pumped into the water processing system for injection into the oil reservoir. The Project Site would be designed to retain, process, and inject storm water within the perimeter fence or wall for a 100-year storm event and process walls/berms would be designed to contain at least 110 percent of the largest vessel. Therefore, similar to any precipitation, any spills on the site would be contained, both within process system walls/berms around equipment and site walls/berms around the site. As a result, impacts to water quality within adjacent drainages and Santa Monica Bay would be less than significant with mitigation.

Mitigation Measures

WR-2 Implement MM HWQ-2a through HWQ-2d.

Residual Impacts

With implementation of measure WR.2, the residual impacts would be considered **less than significant with mitigation (Class II)**.

Impact WR.3 pertains to the following significance criteria:

Wastewater impacts would be deemed significant if the Proposed Oil Project would:

Substantially degrade the quality of surface water or groundwater.

Impact #	Impact Description	Phase	Residual Impact
WR.3	The Proposed Oil Project would generate wastewater that could impact groundwater quality through injection of produced water.	Phase 2 and 4	Class III Less Than Significant

Up to four injection wells have been proposed at the Project Site for disposal of produced water, which is mainly salty water trapped in the reservoir rock and brought up along with oil or gas during production. This water can contain minor amounts of chemicals added downhole during production. In addition, produced waters exist under high pressures and temperatures and usually contain oil and metals; therefore, the water must be treated prior to being discharged. Produced water can also contain high concentrations of salts, metals, hydrocarbon and organic compounds, sulfur, treatment and workover chemicals, dissolved gases (particularly carbon dioxide), bacteria and other living organisms, dispersed solid particles, scales, and other pollutants. However, the particular concentrations of these components vary greatly among different oil fields. This salt water can be very damaging if it is discharged into surface water. Instead, all states require that this brine be injected into formations similar to those from which it was extracted (Produced Water Society 2013; U.S. EPA 2013).

Approximately 65 percent of the produced water generated in the United States is injected back into the producing formation, 30 percent is injected into designated deep saline formations, and five percent is discharged to surface waters. Over two billion gallons of brine are injected daily into injection wells in the United States. Produced water salinity in the United States generally varies from 100 milligrams/liter (mg/l) to 400,000 mg/l. Seawater has a salinity of 35,000 mg/l. Produced water generally increases as oil and gas is depleted from any given well (Produced Water Society 2013; U.S. EPA 2013).

The U.S. EPA classifies oil and gas injection wells as Class II wells. There are approximately 167,000 oil and gas injection wells in the United States and 25,000 such wells in California, most of which are used for the secondary recovery of oil, because the injection of the brine can have the effect of enhancing production of oil and gas from the formations. However, some injection wells are used solely as a disposal well for excess production fluids. Class II wells must adhere to strict construction and conversion standards. A Class II well that follows EPA Federal standards is built very much the same as Class I well, which can be used to dispose of hazardous waste. The California Division of Oil and Gas and Geothermal Resources (DOGGR) regulates oil field waste disposal in injection wells and is expected to use this EIR in its permitting review of the Proposed Oil Project.

All of the injection wells will be drilled from the Project Site. Wastewater would be processed, as described in Impact WR.2, and pumped back into the reservoirs from which the oil and gas was extracted (Figure 2-8, Applicant Proposed Project Lease Areas Cross Sections). As indicated in Section 4.14.1.4, Groundwater, the Project Site is located along the westerly edge of the West Coast Basin. Three major fresh water aquifers comprise the West Coast Basin: the 200-Foot Sand (Gage Aquifer), the Silverado Aquifer, and the Lower San Pedro/Pico Aquifer. Groundwater depth in these predominantly confined aquifers reaches more than 1,500 feet in the West Coast Basin, although water production wells generally are not this deep.

The injection wells would pass through these fresh water deposits, creating potential water quality impacts as a result of well leakage and/or inadvertent migration of wastewater from the point of injection upward through the formation, as a result of frac-outs, which are uncontrolled releases of produced water from the formation. Frac-outs are not to be confused with fracking (i.e., hydraulic fracturing), which is an oil production method whereby a sandy slurry is purposely injected into the oil producing formation, at very high pressures, in an effort to artificially fracture the formation and increase oil flow to the wellbore.

The current mechanism that is creating a stratigraphic and/or structural trap for oil accumulation within the Miocene Puente Formation (the target oil producing formation) would similarly prevent upward migration of injected wastewater (i.e., potential frac-outs) into the overlying aquifers. There are no domestic water supply wells located in the vicinity of the Project Site, thus further minimizing the potential for impairment of beneficial groundwater as a result of produced water injection.

As indicated in Section 4.14.4.2, Proposed Project Design Features, the injection wells would be designed to meet all of the rules and regulations of the California DOGGR. All of the injection wells would have steel casing that would be cemented in place. All of the produced water would be injected through injection tubing that would run down through the steel casing. The tubing would be placed in the well to a point just above the perforations, located at the zone of water injection, and a packer would be used near the bottom of the tubing to seal it against the casing. The packer prevents water from entering the space between the tubing and casing when water is injected down the tubing. Several tests are typically run to ensure that the well is operating properly and that the injected fluids are confined to the intended injection zone (DOGGR 2013).

California Code of Regulations Title 14, Division 2, Section 1724.6 requires that approval must be obtained from the DOGGR before any subsurface injection can begin. The operator must provide any data that that is pertinent and necessary for proper evaluation of the oil reservoirs. Such data includes reservoir characteristics of each injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and residual oil, gas, and water saturations. The DOGGR regularly review water reinjection pressures, quantities, and schedules in order to prevent subsidence beneath the drilling site. All injection wells are monitored by the DOGGR to ensure that the wells are operating properly and have mechanical integrity. Monitoring includes reviewing operational data and running tests like mechanical integrity tests (i.e., spinner, temperature, and pressure tests and tracer surveys). In addition, most well sites are inspected annually by the DOGGR (DOGGR 2013).

Operators of Class II injection wells must file for a permit with the DOGGR. Before a permit is issued, the proposed injection project would be studied by DOGGR engineers and reviewed by the Los Angeles Regional Water Quality Control Board. DOGGR engineers would evaluate the geologic and engineering information, solicit public comments, and hold a public hearing, if necessary. Injection project permits include many conditions, such as approved injection zones, allowable injection pressures, and testing requirements (DOGGR 2013).

In California, Class II injection wells have proved to be an environmentally safe method of disposal of produced water. A peer review conducted by a national organization, the Ground

Water Protection Council, determined that the DOGGR has a program that effectively protects underground sources of drinking water (DOGGR 2013).

In summary, proposed injection wells would pass through and beneath fresh water-bearing sediments within the West Coast Groundwater Basin. Produced water would be treated for excessive solids content prior to reinjection; however, the produced water would be highly saline and could potentially impair groundwater quality in the unlikely event that an injection well leaks in the area near the groundwater. Because 1) the injection wells would be required to meet the DOGGR rules and regulations regarding design and operation; 2) the existing mechanism that is creating the oil trap would prevent upward migration of produced water into overlying water-bearing sediments; 3) and the produced water and other drilling wastes (i.e., incidental spills of petroleum based fluids) would be injected back into the reservoir below the effective base of fresh water, the impacts of injection on groundwater quality would be considered adverse but *less than significant*.

The Applicant has stated in the Proposed Project Application that no high volume/high pressure fracking would occur during oil and gas production activities; therefore, fracking is not proposed and cannot be undertaken under this Proposed Project application and the impact need not be evaluated in this EIR.

Mitigation Measures

Because impacts on groundwater quality would be less than significant, no mitigation measures are required.

Impact WR.4 pertains to the following significance criteria:

With regard to water supply, a project would have a significant environmental impact on the water supply if it:

- Substantially depletes water supplies.
- Requires new off-site water supply (i.e., water not derived from an on-site well or surface water impound) or distributions facilities or expansion of existing facilities, the construction of which would cause substantial adverse physical change in the environment.
- Requires new or expanded water entitlements.

Impact #	Impact Description	Phase	Residual Impact
WR.4	The Proposed Oil Project would require new off-site water supply, but would not substantially deplete water supplies or require new or expanded water entitlements.	Phase 1, 2, 3, and 4	Class III Less Than Significant

Water Demand

Phase 1 grading, Phase 3 Pipeline construction, and Phase 3 on-site construction would require approximately 4 acre-feet of water over a 15 month period. The primary water demand by the Proposed Oil Project would occur during Phases 2 and 4 in association with drilling, which

would result in a projected water use of 4.8 acre-feet per year (AFY) over the 30- to 35-year life of the Proposed Oil Project.

Drilling of each well would require approximately 130,000 gallons of water (0.4 acre-feet). Four wells are proposed in Phase 2, including three production wells and one water injection/disposal well, and the drilling would occur over a period of four months. The remaining 30 production wells and four injection/disposal wells are proposed in Phase 4 and the drilling would occur over a period of 30 months. Since each well takes approximately one month to drill, during Phase 4, approximately 12 wells would be drilled each year. This would result in a potential water usage of approximately 4.8 AFY for drilling.

Phase 4 of the Proposed Oil Project would be designed for a maximum capacity of 8,000 barrels of oil per day. Therefore, 8,000 barrels of oil per day could be extracted from the oil reservoir during Phase 4. However, up to 16,000 barrels per day of produced water would be available to inject back into the reservoir, such that it is unlikely that a supplemental water source would be required for replacement water to prevent regional ground subsidence from occurring in the vicinity of the Proposed Project.

During construction of the temporary City Maintenance Yard, prior to commencement of construction of the Proposed Oil Project, demand of both City Yard employees and contractors involved in construction of the relocated facility would represent an increased demand. Water for construction activities at the site would be minimal. Subsequently, domestic water use during Phases 1, 2, 3, and 4 would be limited to on-site drinking water and restrooms for on-site employees and a minimal number of contractors.

Water Supply

As indicated in Section 4.14.4.2, Proposed Project Design Features, during Phase 2, the water line currently located along 6th Street that serves the Existing City Maintenance Yard would be extended to the temporary construction trailer in the northeast portion of the Project Site. Domestic water demand, i.e., for drinking and restrooms, for Phases 2, 3, and 4 would be provided by California Water Company (Cal Water). Water supplies for drilling would be provided by West Basin Municipal Water District, via extension of an existing recycled water line serving the Greenbelt east of Valley Drive. West Basin has provided the Applicant with a "will serve" letter, which is substantial evidence of sufficient water supply.

Reliability of water supplies from Cal Water and West Basin is provided in their respective Urban Water Management Plans (UWMPs) (Cal Water 2011, West Basin 2011b). The UWMPs demonstrate the water supplier's total projected water supplies available during normal, single dry, and multiple dry water years, during a 20-year projection, as well as the water supplier's existing and planned future uses, including agricultural and manufacturing uses. The projected supplies and demands are presented in 5-year increments for the 20-year projection. California Water Code 10644(a) requires preparation of updated UWMPs every five years and submittal to the California Department of Water Resources, the California State Library, and any city or county within which the supplier provides water supplies. The 2010 West Basin UWMP demonstrates not only how the agency would meet service area retail demands over the next 25 years, but also how the agency plans to provide long-term water reliability through supply

diversification, i.e., less reliability on imported water and increased desalinated water, local groundwater, recycled water, and water conservation.

Water Supply Assessment

Senate Bill (SB) 610 was passed on January 1, 2002, amending California law to require detailed analysis of water supply availability for large development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensuring that land use decisions for certain large development projects are fully informed as to whether sufficient water supplies are available to meet project demands. Under Senate Bill 610, water supply assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects, as defined in Water Code 10912(a), subject to the California Environmental Quality Act.

Under Water Code Section 10912, "Project" means any of the following:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- A mixed-use project that includes one or more of the projects specified in this subdivision; or
- A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project (California DWR 2003).

Based on these definitions of "Project", a water supply assessment would not be required for the Proposed Oil Project. The Project Site is 1.3 acres and the Proposed City Maintenance Yard is similar in size, which is less than the 40 acre threshold that defines a "Project" under this SB 610 criterion. In addition, the water demand associated with the Proposed Oil Project would be less than the amount of water required by a 500 dwelling unit project. In 2010, 22,057 average single-family dwellings in the Hermosa Beach/Redondo Beach area used 6,672 AFY of water, which is equivalent to 0.3 AFY per dwelling (Cal Water 2011). Therefore, 500 dwellings would use approximately 151 AFY. As previously indicated, Phase 2 and Phase 4 drilling would use approximately 4.8 AFY of water. Therefore, the water demand for drilling is substantially less than the annual water demand for 500 dwellings. Water demand for Proposed City Maintenance Yard construction, the only increased demand associated with that component, would be minimal. Therefore, the Proposed Project would not be considered a "Project" under this SB 610 criterion and a water supply assessment would not be required.

Based on the reliability of water, as demonstrated in the UWMPs, in combination with the Proposed Oil Project-specific, West Basin "will serve" letter, water supply related impacts are considered *less than significant*.

Mitigation Measures

No mitigation measures are required.

4.14.5 Other Issue Area Mitigation Measure Impacts

None of these mitigation measures identified in other sections of the EIR would increase the impacts to water resources. Therefore, additional analysis or mitigation for water resources is not required.

4.14.6 Cumulative Impacts and Mitigation Measures

The residential and commercial/industrial projects in the region would produce sanitary wastewater in the same manner as the Proposed Project. Existing and proposed projects use the City utilities and facilities, and the adequacy of new construction is evaluated on a project-specific basis, based on available capacity with respect to the cumulative wastewater load on the sewer system at the time of evaluation.

The Proposed Oil Project and the Proposed City Maintenance Yard Project could connect to the existing sewer if the capacity of the existing system is deemed adequate. However, the Proposed Oil Project could alternatively provide portable facilities to meet peak demand on a temporary basis and reduce the overall and cumulative impacts to a no impact classification.

All drilling related wastewater and incidental spills at the Project Site would be properly disposed of via well reinjection. The Proposed Oil Project and Proposed City Maintenance Yard Project would not require the upgrade, modification, or alteration of any additional wastewater or waste handling facility (see discussion of solid waste in the Section 4.12). Thus, no cumulatively significant impacts to the wastewater or solid waste facilities are expected.

With respect to water supply, cumulative projects would be governed by Senate Bill 610, as applicable, and project specific water supply analyses. West Basin, which would provide the majority of the water for the Proposed Oil Project, overlies nearly all of the adjudicated West Coast Groundwater Basin. In the early 1940s, extensive over pumping of the basin led to critically low groundwater levels, which resulted in seawater intrusion along the coast. The situation precipitated an adjudication that limits the allowable extraction that could occur in any given year and assigned water rights to basin pumpers. Those adjudicated water rights are in excess of the safe operating basin yield. Therefore, the Water Replenishment District of Southern California purchases imported and recycled water supplies from West Basin for injection by the Los Angeles County Department of Public Works at the Dominguez Gap and West Coast seawater intrusion barriers (West Basin 2011b). Based on continued water injection by the Water Replenishment District of Southern California, in combination with compliance with cumulative project-specific CEQA review, Senate Bill 610 requirements, and adjudicated water rights, no cumulatively significant water supply impacts would occur.

4.14.7 Mitigation Monitoring Plan

Mitigation Measure	Requirements	Compliance Verification		
		Method	Timing	Responsible Party
WR-1	Prior to approval of demolition and new construction, a Registered Civil Engineer in the State of California shall evaluate the capacity of the existing sewer line system, beginning at the proposed tie-ins on Valley Drive for the Proposed City Maintenance Yard Project and 6th Street for the Proposed Oil Project, and continuing downstream to the Sanitation Districts of Los Angeles County sewer system, prior to any connections. A 7-day capacity performance test shall be performed, based on Sanitation Districts of Los Angeles County average wastewater generation factors, to determine baseline and peak flows, and to ensure the sewer has adequate capacity in the downstream areas. The capacity analysis shall be submitted to the City Public Works Department and the Districts for review and approval. In the event that existing sanitary sewer facilities are insufficient to accommodate increased flows from the Project Site, the Applicant shall provide mobile sanitary facilities (i.e., toilet, sink, and urinal) for onsite personnel, as necessary.	Area study of the proposed sewer line and a 7-day performance capacity test should be performed at select downstream locations to verify the adequacy of the existing sewer.	Prior to issuance of permit	City of Hermosa Beach
WR-2	Implement MM HWQ-2a through HWQ-2d.	See HWQ-2a through HWQ-2d	See HWQ-2a through HWQ-2d	See HWQ-2a through HWQ-2d

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