Chapter 3
ENVIRONMENTAL SETTING AND PROJECT IMPACTS

3.0.1 INTRODUCTION

This chapter describes the area of influence, setting (environmental and regulatory), methodology, potential impacts, and mitigation measures used to evaluate effects on environmental resources from the proposed Project and alternatives, in the context of NEPA and CEQA requirements. The proposed Project and alternatives are compared by resource area to the NEPA and CEQA Baselines in Sections 3.1 through 3.16 and then compared to each other in Chapter 4, based on anticipated impacts to determine the environmentally preferred and environmentally superior alternative.

3.0.2 ENVIRONMENTAL ANALYSIS PROCEDURES

The content and format of this EIS/EIR are designed to meet the requirements of NEPA and CEQA Guidelines. A discussion of each resource is provided in Sections 3.1 through 3.16 and is organized as follows.

Environmental Setting subsections describe the existing conditions for each environmental resource. These subsections provide the context for assessing potential environmental impacts resulting from construction and operations of the proposed Project and alternatives.

Impacts and Mitigation Measures subsections describe the potentially significant effects or consequences resulting from development of the Project and alternatives. Measures that can mitigate (e.g., minimize, reduce, or avoid) potentially significant adverse environmental effects are proposed as conditions of approval. The *Methodology* used for each issue area impact evaluation is discussed and *Significance Criteria* are described that help evaluate the degree of significance for each potential impact. The criteria used to establish thresholds of significance are based on the policies and guidelines set forth in the *Port of Long Beach Administrative Draft Environmental Protocol ("Protocol")* (Port of Long Beach 2006), and are consistent with NEPA CEQ regulations and the CEQA Guidelines *Appendix G* Environmental Checklist. The Port's Environmental Protocol further refine the thresholds identified in the NEPA CEQ regulations and the CEQA Guidelines *Appendix G* to adequately reflect potential environmental consequences associated with Port operations, which are used as the basis for determining impact significance. The "threshold of significance" for a given environmental effect is the level at which the USACE and the Port, as the lead NEPA and CEQA agencies, find the effects of the proposed Project to be significant. "Threshold of significance" can be defined as:

> *A quantitative or qualitative standard, or set of criteria, pursuant to which significance of a given environmental effect may be determined (CEQA Guidelines Section 15064.7 [a]).*

The impact evaluation discussion describes potential consequences to each resource that would result from development of the proposed Project and alternatives. For each impact identified in this document, a statement of the level of significance of the impact is provided. The level of significance is determined by applying the threshold of significance presented for each issue area. The following categories for impact significance are used in this analysis:

- A designation of no impact is given when no adverse changes in the environment are expected;
- A less-than-significant impact would be identified when there would be no substantial adverse change in the environment;
- A significant (but mitigable) impact would have a substantial adverse impact on the environment, but could be avoided or feasibly mitigated to a less than significant level; and
- A significant unavoidable impact would cause a substantial adverse effect on the environment that cannot be feasibly mitigated or avoided.

Mitigation Measures to minimize, avoid, or reduce potentially significant impacts are presented for each significant impact. Mitigation could include:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing the impact by limiting the degree or magnitude of the action and its implementation;

- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and/or
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures would be made conditions of Project approval that would dictate future development of the Project site and would be monitored to ensure compliance and implementation.

Significance of Impacts after Mitigation refers to the level of impact after the implementation of mitigation. In the case where a mitigation measure(s) would avoid or reduce a significant impact to a level that is less than significant, a determination would be made that the residual impact would be less than significant. In the case where a mitigation measure(s) would reduce a significant impact somewhat, but would not reduce it to a level that is less than significant, then a determination would be made that the residual impact would remain significant. A determination that the residual impact would remain significant is used to identify *Significant Unavoidable Impacts*, as required by Section 15126.2(b) of the CEQA Guidelines. If a significant impact is reduced to a less than significant level by application of a mitigation measure, it is termed a *Significant but Avoidable Impact.*

The *Cumulative Impacts* discussion in each environmental issue section describes potential impacts from Project buildout in combination with development of reasonably foreseeable (proposed and approved, but not built) projects in the area, as described in Chapter 2.0.

3.0.3 BASELINES USED IN THE ENVIRONMENTAL ANALYSIS

NEPA and CEQA Baseline conditions are utilized as the basis for determining significance of impacts for each resource area. The NEPA and CEQA Baselines and their application to analysis of potential impacts from the proposed Project and alternatives are detailed in Section 1.3 of this EIS/EIR.

3.0.4 REQUIREMENTS TO EVALUATE ALTERNATIVES

NEPA (40 CFR 1502.14[a]) and CEQA Guidelines 15126.6 require that an EIS and an EIR describe a range of reasonable alternatives to the Project, or to the location of the Project, that could feasibly attain most of the basic objectives of the Project but would avoid or substantially lessen any significant environmental impacts. The EIS/EIR should compare merits of the alternatives and determine an environmentally superior alternative. Sections 1.6.3.2, 1.6.3.3, and 1.6.3.4 of this EIS/EIR set forth potential alternatives to the Project and describe detailed requirements to evaluate alternatives, as specified by CEQA Guidelines (Section 15126.6).

The information presented in this EIS/EIR specific to impacts on the environment would be used by the USACE as part of any proposed permit action subject to jurisdiction on Section 404 of the CWA and Section 10 of the RHA.

3.0.5 ENVIRONMENTAL RESOURCES NOT AFFECTED BY THE PROPOSED PROJECT

The scope of this EIS/EIR was established based on the December 30, 2005 NOI, the December 15, 2005 Notice of Preparation (NOP) and the accompanying Initial Study (IS), and comments received on those documents. In accordance with NEPA and CEQA, the scoping process and IS for the Project determined that no agricultural resources occur on or near the Project site and, therefore, that there would be no impacts to such resources. Consequently, no further evaluation of the environmental consequences of each Project alternative on agricultural resources is provided in this EIS/EIR.

3.1 GEOLOGY, GROUNDWATER, AND SOILS

3.1.1 Environmental Setting

3.1.1.1 Area of Influence

Geologic impacts can generally be subdivided into geologic impacts on the Project site and impacts of the Project on the geologic environment. The proposed Project could potentially be affected by large earthquakes that could occur anywhere in the greater Los Angeles Basin area, and/or tsunamis resulting from a large offshore earthquake or landslide. Other geologic impacts that could occur to the Project site, such as differential settlement or slope stability, would be more site-specific and confined to the immediate vicinity of the site. The Project area is currently occupied by artificial fill and marine waters. In the absence of natural geologic/topographic features, there is no area of influence with respect to impacts to the geologic environment.

This section also addresses potential soil contamination in areas of proposed ground disturbance (i.e., excavation areas). Therefore, the area of influence includes the Project site, as well as a radius of approximately 2,000 feet from the site. This distance has been established by the California Department of Toxic Substances Control (DTSC) as a “border zone” from potentially contaminated sites and therefore is considered a reasonable area of influence. In addition, this section addresses potential contamination of offshore sediments proposed to be dredged, for which the area of influence is defined as the dredging areas.

3.1.1.2 Setting

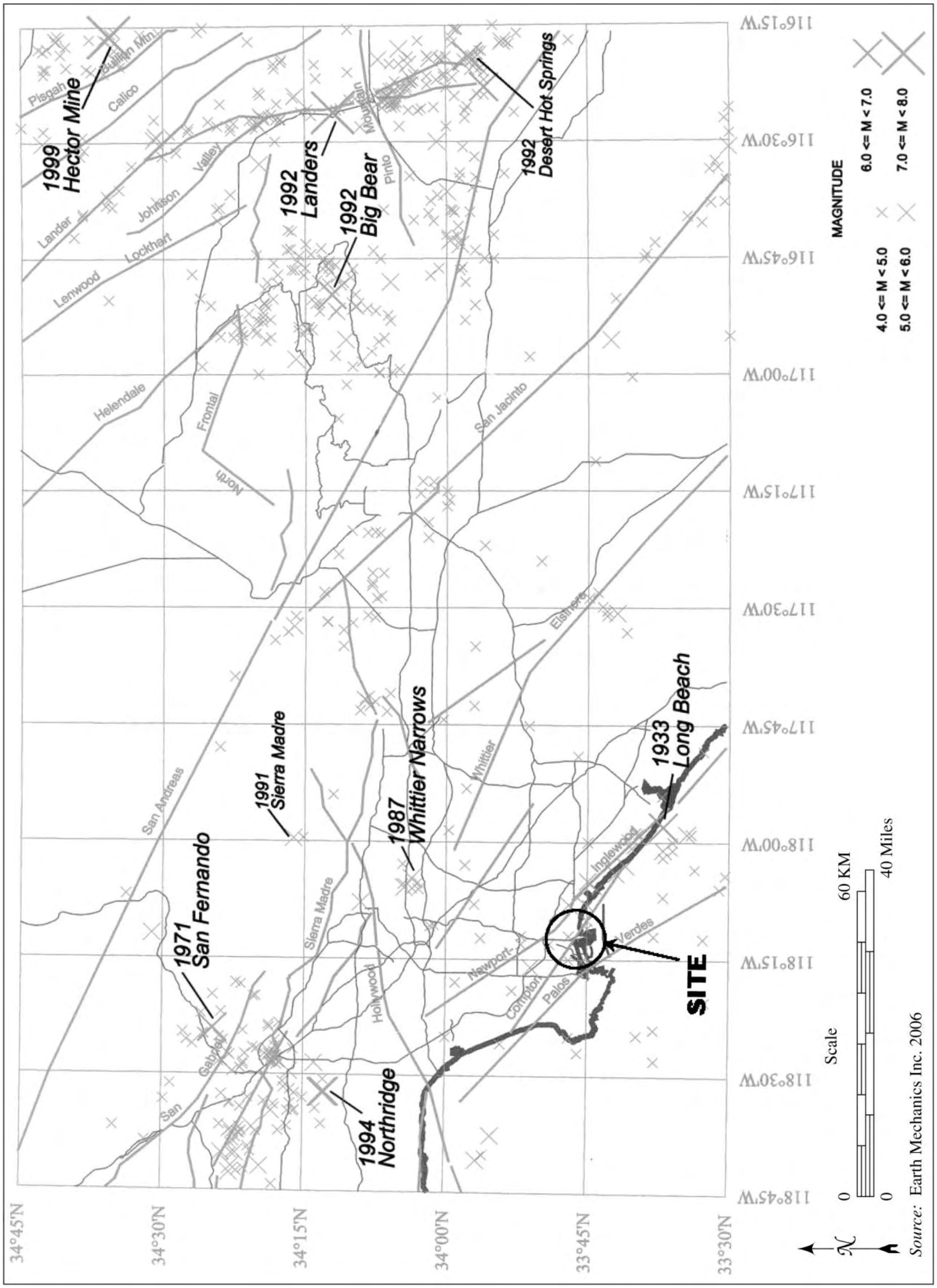
General Geology and Stratigraphy

The POLB is located in the southwestern portion of the Los Angeles Basin, within the seismically active southern California area. The basin consists of a broad coastal plain of low relief that slopes gradually seaward (southwest and south) to the Pacific Ocean. Long Beach Harbor is located in the southern portion of San Pedro Bay, a natural embayment formed by a westerly protrusion of the coastline and the dominant onshore topographic feature, the Palos Verdes Hills. Located approximately 3.5 miles west and northwest of the harbor, the hills form an uplifted, terraced peninsula approximately 1,400 feet high.

The floor of the Los Angeles Basin is characterized by unconsolidated Holocene-age sediments except for local exposures of the underlying Pleistocene-age formations in the small hills and mesas throughout the basin (e.g., Signal Hill). Similar materials occur at the surface and subsurface within the POLB and the immediate offshore area. The Pleistocene materials consist of both non-marine and marine deposits, referred to as the Lakewood and San Pedro formations, which provide firm ground conditions at the POLB (Earth Mechanics, Inc. 2006).

The topography of the site is generally flat and slightly undulating, but slopes gently toward the adjacent Port waters, including the Inner Harbor, Back Channel, East Basin, Slip 1, and Slip 3. The channelized Los Angeles River is located approximately 400 feet east of the proposed Project site, at the closest point. This river represents the principal surface drainage in the vicinity of the harbor, which drains parts of the Los Angeles Basin and the San Fernando Valley into San Pedro Bay. Principal structural elements near the harbor include the northwest-trending, doubly plunging anticline (a folded, dome-like structure) that underlies the Palos Verdes Hills; the adjacent, steeply dipping Palos Verdes Hills Fault Zone; and the northwest-trending Newport-Inglewood Structural Zone (Figure 3.1-1) (Yerkes et al. 1965).

The Los Angeles Basin is notable for its prolific oil production. Historically, subsidence due to oil extraction has been a major problem in the Long Beach and Los Angeles harbor areas. Between 1926 and 1967, approximately 29 feet of total subsidence was recorded near the eastern end of Terminal Island in Long Beach. A maximum annual rate of subsidence of 2.4 feet was recorded between 1951 and 1952 and coincided with the period of maximum oil production (Randell et al. 1983). During this period, extraction of hydrocarbon fluids within the Wilmington oil field caused reduced subsurface fluid pressure, resulting in compaction of oil-producing sediments and surface land subsidence. In 1958, secondary injection of water into oil-depleted zones was initiated, resulting in an eventual reduction of subsidence and partial rebound of much of the subsided area. If the present balance between fluid injection and hydrocarbon withdrawal were maintained, future subsidence of this type would not be a concern (City of Long Beach 2007a).



Source: Earth Mechanics Inc. 2006

Figure 3.1-1. Seismicity Map

Soils/Sediments

The Project area is located on artificial fill material, including hydraulic fills. Specific soil descriptions are derived from geotechnical borings drilled onsite. Soils located between Pier D Street and Ocean Boulevard are generally underlain by fill material, consisting of interbedded sand, silty sand, sandy silt, and clay, to a depth of approximately 30 feet below ground surface (Parsons-HNTB 2005). Borings drilled on Piers D and E, adjacent to Slip 3, encountered artificial fill to a depth of 30 to 40 feet below ground surface. The fill material generally consists of silty fine sand and fine sand with silt. The underlying native materials generally consist of dense sand to a depth of approximately 100 feet below ground surface (Fugro West, Inc. 2004; Pacific Edge Engineering, Inc. 2006).

See Section 3.3, Hydrology and Water Quality, for additional information pertaining to marine water quality associated with proposed excavated and dredged sediments.

Groundwater

Laterally continuous silt and clay layers that act as aquitards to restrict vertical groundwater flow separate aquifers beneath the site. Aquifers beneath the site, in ascending order, include the Silverado aquifer of the San Pedro Formation, the 400-foot aquifer, the Lower 200-foot aquifer, the Principal 200-foot aquifer, and the shallower Marginal and Gaspur aquifers, located in more recent stream channel and flood plain deposits (California Department of Water Resources 1961). The Gaspur aquifer occurs at a depth of approximately 70 feet below ground surface in the Project area. This aquifer is tidally influenced and is brackish due to intrusion by harbor waters (POLB 1996). In addition, shallow brackish groundwater is present at a depth of 10 to 15 feet below ground surface (Pacific Edge Engineering, Inc. 2006). This perched groundwater aquifer is also tidally influenced and not suitable as drinking water.

Seismicity of the Region

<u>Regional Seismicity</u>

Southern California is a seismically active area. On average, the greater Los Angeles area is experiencing compression at rates between five and nine millimeters per year as a result of north-northeasterly tectonic shortening. This compressional tectonic behavior results in a complex mixture of strike-slip and reverse (thrust) faulting and folding. Some of the reverse and thrust faults are poorly located and poorly understood, but earthquakes such as the 1987 Whittier Narrows and 1994 Northridge earthquakes (Figure 3.1-1) provide evidence for the occurrence of subsurface “blind” reverse faults and the associated importance to seismic design. Nevertheless, the bulk of tectonic activity in the Long Beach region during Quaternary time (last 1.6 million years) appears to have occurred along the nearby Palos Verdes Fault and Newport-Inglewood Fault Zone, both of which are primarily strike-slip faults and represent the most significant seismic potential for the POLB (Earth Mechanics, Inc. 2006). Other nearby, but less active, seismic sources include the Compton Thrust, THUMS-Huntington Beach Fault, Cabrillo Fault, and Los Alamitos Fault (Figure 3.1-2) (Earth Mechanics, Inc. 2006; Dames & Moore 1998).

The southern California region has been subjected to at least 52 major earthquakes of Richter magnitude (M) 6.0 or greater since 1796. The Richter scale is a logarithmic scale used to express the magnitude of a seismic disturbance (i.e., earthquake) as a range of numerical values that indicate the amount of energy dissipated during the event. Values generally range from 0 to 10. Each whole number increase in Richter M represents a tenfold increase in the wave amplitude generated by the earthquake, which is a representation of the size of an earthquake. For each full point increase in Richter magnitude, the corresponding amount of energy released increases 31.6 times. Thus, an M 6.3 earthquake is ten times larger in wave amplitude than an M 5.3 earthquake and releases 31.6 times more energy. Earthquakes of M 6.0 to 6.9 are classified as “moderate;” earthquakes between M 7.0 and 7.9 are classified as “major;” and M 8.0 and greater are classified as “great.” Damage begins at M 4.5.

Ground motion in the region is generally the result of sudden movements of large blocks of the earth’s crust along fault lines. Great earthquakes, like the 1857 San Andreas Fault earthquake (Table 3.1-1 and Figure 3.1-1), are quite rare in southern California. Earthquakes of M 7.8 or greater occur at the rate of about two or three per 1,000 years, corresponding to a six to nine percent probability of occurrence in a 30-year period. However, the probability of a M 7.0 or greater earthquake occurring in southern California before the year 2024 is estimated at 85 percent (WGCEP 1995).

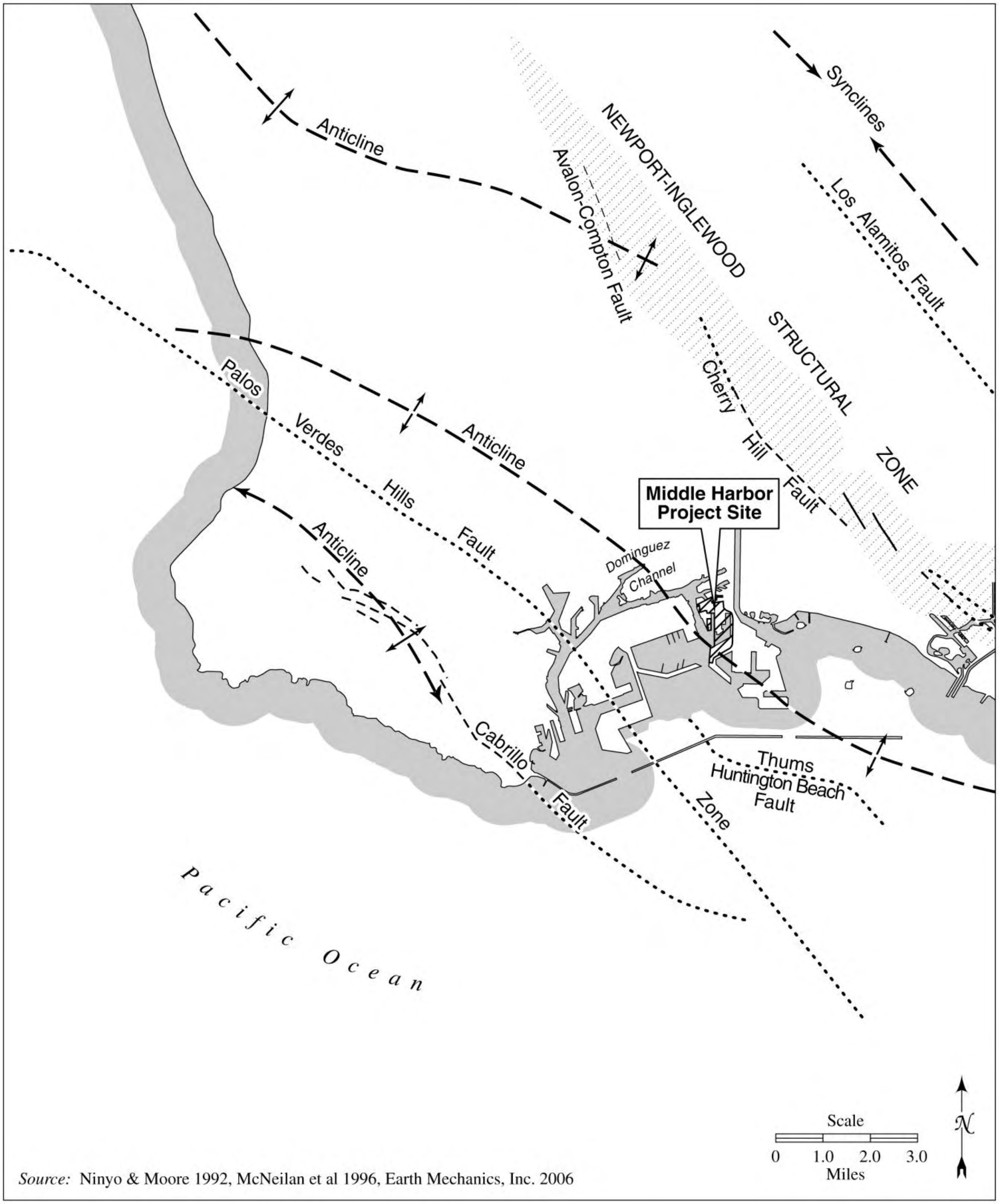


Figure 3.1-2. Local Faults and Geologic Structures – West Los Angeles Basin

Table 3.1-1. Known Earthquakes with Richter Magnitude Greater than 5.5 in the Los Angeles Basin Area

Fault Name	Date	Richter Magnitude
Palos Verdes Fault	*	*
San Pedro Basin Fault	*	*
Santa Monica-Raymond Fault	1855	6.0
San Andreas Fault	1957 1952	8.2 7.7
Newport-Inglewood Fault	1933	6.3
San Jacinto Fault	1968	6.4
San Fernando/Sierra Madre-Cucamonga Fault	1971 1991	6.4 6.0
Whittier-Elsinore Fault Zone	1987	5.9
Camp Rock/Emerson Fault	1992	7.4
Blind thrust fault beneath Northridge	1994	6.6

Note:
* No known earthquakes within the last 200 years.
Source: Ninyo & Moore 1992; U.S. Geological Survey/Caltech 1992 and 1994.

Seismic Design Basis

A maximum credible earthquake (MCE) is the largest earthquake that a fault appears to be capable of generating under present seismotectonic conditions. MCEs are estimated using historical seismicity, published geologic evidence of seismic events, and empirical relationships between fault rupture length and magnitude that are based on data from historical earthquakes. The peak ground acceleration (PGA) due to an estimated MCE is expressed relative to gravitational acceleration (g) on the earth.

The Palos Verdes Hills Fault is an active, northwest-southeast trending fault zone, located about 3.0 miles southwest of the site (Figure 3.1-1). The MCE for the Palos Verdes Hills Fault is M 7.0. An earthquake of this magnitude at a distance of 3.0 miles is expected to produce a mean PGA on the order of 0.45 g (Dames & Moore 1998).

The Newport-Inglewood Fault Zone is an active fault located about 3.6 miles east-northeast of the site. The MCE for the Newport-Inglewood Fault is M 7.0. An earthquake of this magnitude at a distance of 3.6 miles is expected to produce a mean PGA of 0.43 g (Dames & Moore 1998).

Two levels of strong ground motion are used in design (Fugro West, Inc. 1997; Woodward-Clyde Consultants 1996; Earth Mechanics, Inc. 2006). An Operating Level Event (OLE) is a design event with 50 percent exceedance probability in 50 years (a return period of 72 years). The Contingency Level Event (CLE) is the design event with a 10 percent exceedance probability in 50 years (return period of 475 years). The typical design philosophy for permanent facilities and structures is to provide sufficient protection such that an OLE would not significantly disrupt normal operations. Under the CLE, significant but repairable damage can occur, but the facility should not experience catastrophic failure or collapse (Woodward-Clyde Consultants 1996).

A probabilistic seismic hazard analysis was recently completed for the POLB (Earth Mechanics, Inc. 2006), using the latest revisions of ground attenuation models commonly used in California, including the latest version of an attenuation model that is currently under development as part of the Pacific Earthquake Engineering Research/Lifelines Next Generation Attenuation Project. Dredged fill materials are not considered representative of firm ground conditions assumed in the probabilistic hazard studies. Therefore, an assessment of ground conditions was completed to establish appropriate depths to firm ground conditions and to assess appropriate seismic design. The depth to firm ground was established to be approximately 100 feet.

Results of the probabilistic seismic hazard analysis indicate that the seismic hazard at the POLB is dominated by the Palos Verdes Fault for return periods greater than 200 years, which is equivalent to an approximate annual probability of exceedance of 1/200, or 0.005). Variation in expected shaking levels due to differing distances among POLB locations to the Palos Verdes Fault is small, thus justifying adoption of one set of Port-wide design spectra for all future Port projects. Therefore, the Port-wide design PGA is 0.50 g for the CLE, with a corresponding dominant source of earthquake M 7.0 on the nearby Palos Verdes Fault (four km from the Port). Similarly, the design

PGA is 0.21 g for the OLE, with a corresponding dominant source of M 6.5, on a fault located at a distance of 20 km.

Earthquake-Related Effects

Earthquake-related effects include liquefaction, seismically induced settlement, tsunamis, and seiches. Liquefaction occurs when pore-water pressure in loose, saturated, granular soils exceeds confining pressure due to earthquake-induced ground shaking. When these conditions occur, soil strength dramatically decreases resulting in a near liquid state. Liquefaction can cause damage to foundations or other structures. Liquefaction occurs most commonly where loose, cohesionless, granular, sand and silty sand deposits coincide with shallow groundwater conditions. Gravelly sand deposits and deposits with greater than 15 percent clay are less likely to liquefy. The Project site is underlain by shallow groundwater and hydraulic fill and may be susceptible to liquefaction.

Seismically induced settlement consists of the compaction or consolidation of soils as a result of seismically induced ground shaking. Loose, sandy and/or silty soils are typically most susceptible to seismic settlement. Differential compaction may occur during settlement and result in serious damage to structures.

Tsunamis

Tsunamis are gravity waves of long wavelength generated by sudden disturbance in a body of water. Typically, oceanic tsunamis are the result of sudden vertical movement along a fault rupture in the ocean floor, submarine landslides or subsidence, or volcanic eruption, where the sudden displacement of water sets off transoceanic waves with wavelengths of up to 125 miles and with periods generally from five to 60 minutes. The trough of the tsunami wave arrives first leading to the classic retreat of water from the shore as the ocean level drops. This is followed by the arrival of the crest of the wave which can run up on the shore in the form of bores or surges in shallow water or simple rising and lowering of the water level in relatively deeper water such as in harbor areas.

Tsunamis are a relatively common natural hazard, although most of the events are small in amplitude and not particularly damaging. However, in the event of a large submarine earthquake or landslide, coastal flooding may be caused by either run-up of broken tsunamis in the form of bores and surges or by relatively dynamic flood waves. In the process of bore/surge-type run-up, the onshore flow (up to tens of feet per second) can cause tremendous dynamic loads on the structures onshore in the form of impact forces and drag forces, in addition to hydrostatic loading. The subsequent drawdown of the water after run-up exerts the often crippling opposite drags on the structures and washes loose/broken properties and debris to sea; the floating debris brought back on the next onshore flow has been found to be a significant cause of extensive damage after successive run-up and drawdown. As has been shown historically, the potential loss of human life in the process can be great if such events occur in populated areas.

Abrupt sea level changes associated with tsunamis have reportedly caused damage to moored vessels within the outer portions of Long Beach and Los Angeles harbors. The Chilean Earthquake of May 1960, for example, caused local damages of over $1 million and harbor closure. One person drowned at Cabrillo Beach and one was injured. Small craft moorings in the Los Angeles Harbor area, especially in the Cerritos Channel, where a seiche occurred, were seriously damaged. Hundreds of small boats broke loose from their moorings, 40 sank, and about 200 were damaged. Gasoline from damaged boats caused a major spill in harbor waters and created a fire hazard. Currents of up to eight knots and a six-foot rise of water in a few minutes were observed in the West Basin of the Los Angeles Harbor. The maximum water level fluctuations recorded by gauges were 5.8 feet in Long Beach Harbor and five feet at Berth 60 (near Pilot Station) in Los Angeles Harbor (National Geophysical Data Center 1993).

Until recently, projected tsunami run-ups along the western U.S. were based on farfield events, such as submarine earthquakes or landslides occurring at great distances from the U.S., as described above for the Chilean Earthquake of May 1960. Based on such distant sources, tsunami-generated wave heights of between 6.5 feet and eight feet above lowest tide levels at 100-year intervals and between 10 feet and 11 feet at 500-year intervals, were projected, including the effects of astronomical tides (Houston 1980).

However, more recent studies (Synolakis et al. 1997; Borrero et al. 2001) have projected larger tsunami run-ups based on near-field events, such as earthquakes or submarine landslides occurring in proximity to the California coastline. Offshore faults present a larger local tsunami hazard than previously thought, posing a direct threat to nearshore facilities. For example, one of the largest such features, the Santa Catalina Fault, lies directly under Catalina Island, located 22 miles from the Port. Simulations of tsunamis generated by uplift on this fault suggest waves in the Port in excess of 12 feet, with an arrival time within 20 minutes (Legg et al. 2003; Borrero et al. 2005). These simulations were based on rare events, representative somewhat of worst-case scenarios.

In a study modeling potential tsunami generation by local offshore earthquakes, Legg et al. (2004), considered the relative risk of tsunamis from a large catastrophic submarine landslide (likely generated by a seismic event) in offshore southern California versus fault-generated tsunamis. The occurrence of a large submarine landslide appears quite rare by comparison with the tectonic faulting events. Although many submarine landslides have been mapped off the southern California coast, few appear to be of the scale necessary to generate a catastrophic tsunami. Of two large landslides that appear to be of this magnitude, Legg et al. indicate that one landslide is over 100,000 years old and the other approximately 7,500 year old. In contrast, the recurrence of three to 20 feet fault movements on offshore faults would be several hundred to several thousand years. Consequently, the study concludes that the most likely direct cause of most of the local tsunamis in southern California is tectonic movement during large offshore earthquakes.

Based on these recent studies (Synolakis et al. 1997; Borrero et al. 2001), the CSLC developed tsunami run-up projections for the POLB and POLA of eight feet and 15 feet above mean sea level (MSL), at 100- and 500-year intervals, respectively, as a part of their Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) (CSLC 2004).

Most recently, a model has been developed for the Long Beach/Los Angeles Port Complex that incorporates these additional factors (Moffatt & Nichol 2006a). The Port Complex model uses a methodology similar to the above studies to generate a tsunami wave from a M 7.0 earthquake on the Santa Catalina Fault, a reasonable maximum for future events, but the Port Complex model incorporates consideration of the landfill configurations, bathymetric features, and the interaction of the diffraction, reflection, and refraction of the tsunami wave within the complex to predict tsunami water levels. The model is also being used for simulating several other potential local sources, including landslides, with the worst-case scenario for predicted water levels being the Santa Catalina Fault. The model predicts tsunami wave heights of up to five feet in the Project area.

Seiches

Seiches are seismically induced water waves that surge back and forth in an enclosed basin and may be expected in the harbor as a result of earthquakes. Any significant wave front could cause damage to seawalls and docks, and could breach sea walls at the Project site. Modern shoreline protection techniques are designed to resist seiche damage. The Long Beach/Los Angeles Port Complex model referred to above considered impacts from tsunamis and seiches. In each case, impacts from a tsunami were equal to or more severe than those from a seiche. As a result, the impact discussion below refers primarily to tsunamis as this is considered the worst case for potential impacts.

Flooding

See Section 3.3, Hydrology and Water Quality, for flooding information not related to tsunamis or seiches.

Soil and Groundwater Contamination

Historically, the Project area has been intensively used for various Port activities. Most of the area has been utilized as a break-bulk/container terminal for several decades. The area for the proposed expanded Pier F intermodal railyard and Pier F tail track are presently a railyard. Oil production has occurred at two locations on Pier E. Soil sampling and analysis has been completed in proposed excavation areas associated with widening Slip 3.

<u>Oil Production Facilities</u>

The Project site is located within the Wilmington Oil Field, the third largest oil field in the U.S. Portions of Pier E have been used as an oil and gas production field since the late 1930s. Associated oil field infrastructure, such as oil separation facilities, storage tanks, and pipelines (oil, gas, and water) continue to be used on the property, as illustrated on Figure 1.5-2.

Substances that are commonly found in oil fields include various types of petroleum hydrocarbons, such as volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Petroleum hydrocarbons associated with crude oil production, storage, processing, and transport are the primary substances potentially present in onsite soils and groundwater. The most frequently occurring VOCs found in soils and groundwater at oil fields are xylenes and ethylbenzene, followed by toluene and benzene (benzene, toluene, ethylbenzene, and xylenes together are referred to as “BTEX”), all of which are commonly found in crude oil. The most frequently occurring SVOCs found in crude oil are phenanthrene, 2-methylnaphthalene, and naphthalene. Other SVOCs that could be found include acenaphthene, acenaphthylene, benzo(a)–anthracene, benzo(b)–pyrene, benzo(b)–fluoranthene, benzo(g,h,i)–perylene, benzo(k)–fluoranthene, benzyl alcohol, chrysene, fluor-anthene, ideno(1,2,3-c,d)–pyrene, and pyrene. In addition, metals may also be present in association with oil production, most notably in waste sumps located on or near drilling sites and production facilities.

Organic vapors may also be detected in an oil field. It is possible that petroleum hydrocarbon-impacted soils and groundwater associated with oil fields and abandoned wells are capable of generating methane gas through biodegradation. Other vapors, such as benzene and hydrogen sulfide may also be generated.

Rail Facilities

The LBCT facility (Berths F8-10) is located on Pier F and has an existing intermodal rail facility. Railroad easements and railyards are commonly underlain by contaminated soil and groundwater due to spillage of chemicals and use of pesticides and herbicides along the tracks for weed control.

Sediments to be Excavated

The POLB conducted sediment quality testing in areas to be excavated adjacent to Slip 3 (Pacific Edge Engineering, Inc. 2006). Samples were analyzed for total extractable hydrocarbons (TEHs), VOCs, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), metals, and polynuclear aromatic hydrocarbons (PAHs). The following is a summary of the analytical results.

- TEH concentrations, as oil and diesel, were detected in 10 of 133 samples, at maximum concentrations of 180 parts per million (ppm) and 105 ppm, respectively.
- Of 93 samples analyzed, VOCs were not detected above practical quantitation limits (PQLs), or the lowest levels which can be routinely quantified and reported by a laboratory.
- Of 133 samples analyzed, OCPs dichloro-diphenyl-dichloroethylene (DDE) and dichloro-diphynel-trichloroethane (DDT) were detected above PQLs in one boring, to a depth of 14 feet, and in three other borings, to a depth of three feet.
- PCBs were not detected in any of the 133 samples analyzed for these contaminants.
- Hazardous concentrations of metals were not detected in the 133 samples analyzed.
- Carcinogenic PAHs (based on the EPA Region 9 Preliminary Remediation Goals) were detected in 31 of the 133 samples analyzed, at depths varying from five to 60 feet below ground surface.

See Section 3.3, Hydrology and Water Quality, for additional information pertaining to proposed excavated and dredged sediment suitability.

3.1.1.3 Regulatory Setting

Geology/Seismicity

The criteria used to estimate fault activity in California are described in the Alquist-Priolo Special Studies Zones Act of 1972, which addresses only surface fault-rupture hazards. The legislative guidelines to determine fault activity status are based on the age of the youngest geologic unit offset by the fault. An active fault is described by the California Division of Mines and Geology (CDMG) as a fault that has “had surface displacement within Holocene time (about the last 11,000 years).” A potentially active fault is defined as “any fault that showed evidence of surface displacement during Quaternary time (last 1.6 million years).” An inactive fault is any fault that is proven by direct evidence not to have moved within Quaternary time.

The Seismic Hazards Mapping Act of 1990 (PRC §§ 2690 and following as Division 2, Chapter 7.8), as supported by the Seismic Hazards Mapping Regulations (CCR, Title 14, Division 2, Chapter 8, Article 10), were promulgated for the purpose of protecting the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failures, or other hazards caused by earthquakes. Special Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (CDMG 1997), constitutes the guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures as required by PRC Section 2695(a).

The California Building Code corresponds to the body of regulations known as CCR, Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 to be enforceable.

The Uniform Building Code (UBC), published by the International Conference of Building Officials, is a widely adopted model building code in the U.S. The California Building Code incorporates the UBC by reference, along with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions.

In order for dredged sediments to be reused for construction purposes, the sediment characteristics must be suitable for the specific type of proposed construction. Sediment characteristics such as grain size, relative density, and permeability have an effect on the bearing capacity and general suitability of the sediments during reuse. For example, fine-grained silts and clays with low hydraulic conductivities would be desirable for use as backfill behind a cut-off wall, which are designed to prevent lateral migration of groundwater and associated sediment and groundwater contamination. Geotechnical testing of dredged sediments is completed in accordance with state or local building codes. Specifically, fill that would be subject to traffic, such as at container terminals and on roads, should follow guidelines specified in the Caltrans Highway Design Manual (Caltrans 1995). In addition, a number of physical tests have been described by the USACE to characterize sediment for beneficial reuses, including construction and engineering applications (Winfield and Lee 1999).

The Surface Mining and Reclamation Act of 1975 (SMARA) was enacted to promote conservation of the State's mineral resources and to ensure adequate reclamation of lands once they have been mined. Among other provisions, SMARA requires the State Geologist to classify land in California for mineral resource potential. The four categories include: Mineral Resource Zone (MRZ)-1, areas of no mineral resource significance; MRZ-2, areas of identified mineral resource significance; MRZ-3, areas of undetermined mineral resource significance; and MRZ-4, areas of unknown mineral resource significance. The distinction between these categories is important for land use considerations. The presence of known mineral resources, which are of regional significance and possibly unique to that particular area, could potentially result in non-approval or changes to a given project if it were determined that those minerals would no longer be available for extraction and consumptive use. To be considered significant for the purpose of mineral land classification, a mineral deposit, or a group of mineral deposits that can be mined as a unit, must conform to marketability and threshold value criteria adopted by the California State Mining and Geology Board.

Soil and Groundwater Contamination

Applicable federal, state, and local laws each contain lists of hazardous materials or hazardous substances that may require special handling if encountered during Project construction. These include "hazardous substances" under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the state Hazardous Substances Account Act (Health and Safety Code Section 25300, *et seq.*); "hazardous materials" under Health and Safety Code Section 25501, California Labor Code Section 6380 and CCR Title 8, Section 339; "hazardous substances" under 40 CFR Part 116; and, priority toxic pollutants under CFR Part 122. In addition, "hazardous materials" are frequently defined under local hazardous materials ordinances, such as the Uniform Fire Code.

Generally speaking, a "hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials that are commonly found in soil and groundwater include petroleum products, fuel additives, heavy metals, and volatile organic compounds.

Hazardous substances are defined by federal and state regulations as substances that must be regulated in order to protect the public health and the environment. Hazardous materials are characterized by certain chemical, physical, or infectious properties. CCR Title 22, Chapter 11, Article 2, Section 66261 defines a hazardous material as a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of or otherwise managed.

According to Title 22 (Chapter 11, Article 3, CCR), substances having a characteristic of toxicity, ignitability, corrosivity, or reactivity are considered hazardous. Hazardous wastes are hazardous substances that no longer have a practical use, such as materials that have been abandoned, discarded, spilled, or contaminated, or which are being stored prior to disposal.

Depending on the type and degree of contamination that is present in soil, any of several governmental agencies may have jurisdiction over the Project site. Generally, the agency with the most direct statutory authority over the affected media would be designated as the lead agency for purposes of overseeing any necessary investigation or remediation. Typically, sites that are nominally contaminated with hazardous materials remain within the jurisdiction of local hazardous materials agencies, such as the Long Beach Fire Department (LBFD). Sites that have more heavily contaminated soils are more likely to fall under the jurisdiction of the DTSC, which is authorized to administer the federal hazardous waste program under the Resource Conservation and Recovery Act (RCRA) and is also responsible for administering the State Superfund Program, under the Hazardous Substance Account Act.

Sites that have contaminated soil and groundwater fall within the jurisdiction of the RWQCB and may be subject to the requirements of the Porter-Cologne Water Quality Control Act. Contaminated groundwater that is proposed to be discharged to surface waters or to a publicly owned treatment system would be subject to the applicable provisions of the CWA, including permitting and possibly pretreatment requirements. A NPDES permit is required to discharge pumped groundwater to surface waters, including local storm drains, in accordance with California Water Code Section 13260. Additional restrictions may be imposed on discharges to water bodies, including San Pedro Bay, that are listed as "impaired" under Section 303(d) of the CWA.

Section 3.3, Hydrology and Water Quality includes additional information pertaining to proposed excavated and dredged sediment suitability.

In July 2002, the EPA amended the Oil Pollution Prevention regulation at Title 40 of the CFR, Part 112 (40 CFR 112), incorporating revisions proposed in 1991, 1993, and 1997. Subparts A through C of the Oil Pollution Prevention regulation are often referred to as the "SPCC Rule" because they describe the requirements for certain facilities to prepare, amend, and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans. These plans ensure that facilities put in place containment and other countermeasures to prevent oil spills that could reach navigable waters. In addition, oil spill contingency plans are required as part of this legislation to address spill cleanup measures after a spill has occurred.

3.1.2 Impacts and Mitigation Measures

3.1.2.1 Significance Criteria

Criteria for determining the significance of impacts related to geology, groundwater, and soils are based on the POLB Environmental Protocol (POLB 2006) and are consistent with CEQA Guidelines *Appendix G* Environmental Checklist.

Construction Impacts

Impacts during Project construction would be considered significant under the following circumstances:

GEO-1: Substantial alteration of the topography beyond that resulting from natural erosion and depositional processes;

GEO-2: Unique geologic features (such as paleontological resources) or geologic features of unusual scientific value would be disturbed or otherwise adversely affected;

GEO-3: Geologic processes such as erosion would be triggered or accelerated;

GEO-4: Known mineral (petroleum or natural gas) resources would be rendered inaccessible; or

GEO-5: The presence of soil or groundwater contamination creates a significant hazard to the public or the environment.

Operational Impacts

Impacts during Project operations would be considered significant under the following circumstances:

GEO-6: Ground rupture due to an earthquake at the site and attendant damage to structures, limiting their use due to safety considerations or physical condition;

GEO-7: Earthquake-induced ground motion (shaking) causing liquefaction, settlement, or surface cracks at the site and attendant damage to proposed structures, resulting in a substantial loss of use for more than 60 days or exposing the public to substantial risk of injury; or

GEO-8: Exposure of people or property to a greater than average risk of tsunamis or seiches.

As indicated in the IS, there is no potential for the proposed Project to induce or be affected by landslides or mudflows; therefore, this issue is not addressed in this EIS/EIR.

Flooding (not associated with tsunamis or seiches) is addressed in Section 3.3, Hydrology and Water Quality.

3.1.2.2 Methodology

Geologic/Seismic

Geological impacts were evaluated in two ways: (1) impacts of the Project on the local geologic environment; and (2) impacts of geohazards on Project components that may result in substantial damage to structures or infrastructure or expose people to substantial risk of injury. Impacts would be considered significant if the Project meets any of the significance criteria identified above.

In addition, the assessment of impacts is based on the following regulatory controls that would govern various Project components and are the basis for federal and state permits that would be required prior to construction:

- An individual NPDES permit would be prepared for stormwater discharges or coverage under the General Construction Activity Stormwater Permit, in order to contain construction-induced stormwater runoff. A SWPPP would be completed in association with the NPDES permit;
- Backland improvements would be designed and constructed in accordance with City of Long Beach Planning & Building Department, Building Code Requirements, to minimize impacts associated with seismically induced geohazards; and
- Wharf improvements would be designed and constructed in accordance with MOTEMS and POLB standards, including a recently completed ground motion study (Earth Mechanics, Inc. 2006), to minimize impacts associated with seismically induced geohazards. Such construction would include, but not be limited to, completion of site-specific geotechnical investigations regarding construction and foundation engineering. Measures pertaining to temporary construction conditions would be incorporated into the design. A licensed geologist or engineer would monitor construction to verify that construction occurs in concurrence with Project design.

Soil and Groundwater Contamination

Soil and groundwater contamination impacts have been evaluated with respect to the significance criteria listed above. In addition, the assessment of impacts is based on the following regulatory controls that would govern various Project components and are the basis for federal and state permits that would be required prior to construction:

- An SPCC Plan and an Oil Spill Contingency Plan (OSCP) would be prepared, and would be reviewed and approved by the California Department of Fish and Game Office of Spill Prevention and Response, in consultation with other responsible agencies. The SPCC would detail and implement spill prevention and control measures to prevent oil spills from seeping into onsite soils and reaching navigable waters. The OSCP would identify and plan as necessary for contingency measures that would minimize damage to soil and water quality and provide for restoration to pre-spill conditions;
- Any contaminated soil encountered during construction, caused by prior activities, would be remediated and/or disposed in accordance with all federal, state, and local regulations. Similarly, the POLB would

remediate all contaminated soil and groundwater, occurring as a result of Project related oil spills, in accordance with all federal, state, and local regulations; and

- Dredged sediments in confined disposal facilities would be disposed in accordance with suitability requirements established by the USACE and dewatering discharge requirements established by the California Regional Water Quality Control Board.

In accordance with standard POLB lease conditions, future tenants would implement a source control program, which provides for the inspection, control, and cleanup of leaks from aboveground tank and pipeline sources, as well as requirements related to groundwater and soil remediation.

Potential impacts to surface water and marine water quality are addressed in Section 3.3, Hydrology and Water Quality.

3.1.2.3 Alternative 1 – 345-Acre Alternative (the Project)

Construction Impacts

Impact GEO-1: The Project would not substantially alter the topography beyond that resulting from natural erosion and depositional processes.

The Project area consists of a relatively flat, paved, hydraulically filled peninsula. Although new areas of fill would be created, these areas are currently harbor waters.

CEQA Impact Determination

As the topography in the vicinity of the Project site is flat and not subject to landslides or mudflows, less than significant impacts would occur under CEQA with respect to alteration of the topography, beyond that resulting from natural erosion and depositional processes.

Mitigation Measures

As impacts on geologic and topographic features would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on geologic and topographic features would be less than significant.

NEPA Impact Determination

Impacts of backland development are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. Consequently, there would be no impacts associated with development on existing backlands under NEPA. Development on proposed fill would not result in alteration of the topography, beyond that resulting from natural erosion and depositional processes. Therefore, impacts would be less than significant under NEPA.

Mitigation Measures

As impacts on geologic and topographic features would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on geologic and topographic features would be less than significant.

Impact GEO-2: The Project would not disturb or otherwise adversely affect unique geologic features (e.g., paleontological resources) or geologic features of unusual scientific value.

Since the Project area is relatively flat and paved, with no prominent geologic or topographic features, the Project would not result in any distinct and prominent geologic, paleontological, or topographic features being destroyed, permanently covered, or materially and adversely modified.

CEQA Impact Determination

As the Project would not result in any distinct and prominent geologic, paleontological, or topographic features being destroyed, permanently covered, or materially and adversely modified, no impacts would occur under CEQA.

Mitigation Measures

As impacts on unique geologic features would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on unique geologic features would not occur.

NEPA Impact Determination

Impacts of backland development are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. Consequently, there would be no impacts associated with development on existing backlands under NEPA. Development on proposed fill would not result in any distinct and prominent geologic, paleontological, or topographic features being destroyed, permanently covered, or materially and adversely modified. Therefore, no impacts would occur under NEPA with respect to unique geologic features.

Mitigation Measures

As impacts on unique geologic features would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on unique geologic features would not occur.

Impact GEO-3: The Project would not accelerate geologic processes, such as erosion.

Project construction would require grading, soil excavation, temporary stockpiling of soil, and paving. These activities would result in a temporary increase in the potential for wind and water erosion and associated siltation of the adjoining channels. Runoff of soil would be controlled by use of BMPs, as required by either the General Construction Activity Stormwater Permit or a site-specific SWPPP for the Project, issued by the RWQCB. This would minimize the amount of soil runoff and deposition in the harbor.

<u>CEQA Impact Determination</u>

As Project runoff would be controlled by use of BMPs, soil runoff and deposition in the harbor would be minimized, thus resulting in less than significant erosional impacts under CEQA.

Mitigation Measures

As impacts on geologic processes would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on geologic processes would be less than significant.

<u>NEPA Impact Determination</u>

Impacts of erosion due to backland development are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. Consequently, there would be no impacts associated with development on existing backlands under NEPA. Development on proposed fill would be controlled by use of BMPs such that runoff and deposition in the harbor would be minimized, thus resulting in less than significant erosional impacts under NEPA.

Mitigation Measures

As impacts on geologic processes would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on geologic processes would be less than significant.

Impact GEO-4: The Project site is underlain by the Wilmington Oil Field.

Two oil production areas are present on existing Pier E. Although one of these areas would be abandoned during Project construction, the second area would remain active. With the exception of this second oil property, the Project would preclude oil and gas drilling from within Project boundaries. However, petroleum reserves beneath the site could be accessed from remote locations, using directional (or slant) drilling techniques.

<u>CEQA Impact Determination</u>

As petroleum reserves beneath the site could be accessed from remote locations, mineral resource impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on mineral resources would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on mineral resources would be less than significant.

<u>NEPA Impact Determination</u>

In-water construction would result in filling of Slip 1 and the East Basin. Project construction and operations on these new areas of fill would potentially preclude oil and gas drilling from within Project boundaries; however, petroleum reserves beneath the site could be accessed from remote locations, using directional (or slant) drilling techniques. Therefore, the proposed Project would not result in the loss of availability of a known mineral resource that would be of future value to the region, and less than significant mineral resource impacts would occur under NEPA.

Mitigation Measures

As impacts on mineral resources would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on mineral resources would be less than significant.

Impact GEO-5: Construction activities may encounter toxic substances or other contaminants associated with historical uses of the Port, resulting in short-term exposure (duration of construction) to construction personnel.

Limited concentrations of TEHs, DDE, DDT, and carcinogenic PAHs have been detected in soils adjacent to Slip 3. As discussed under **Impact GEO-4**, two oil production areas are currently present on Pier E. Petroleum impacted soils and/or shallow groundwater may be encountered during grading, utility relocation, utility protection, and construction activities. In addition, the LBCT facility (Berths F8-10), located on Pier F has an existing on-dock rail facility. Railroad easements and railyards are commonly underlain by contaminated soil and/or groundwater, due to spillage of chemicals and use of pesticides and herbicides along the tracks for weed control. Residual concentrations of various types of hazardous substances may be present in onsite soils and groundwater. The presence of such substances in the subsurface could pose a health risk to grading/ construction personnel if not removed/remediated in accordance with standards of applicable regulatory agencies. Similarly, soil contamination as a result of prior spills on adjacent properties could potentially extend onto the Project site.

In addition, it is possible that undocumented oil field equipment, such as buried sumps and pipelines, could be encountered during grading of the site. If any abandoned or unrecorded wells are discovered or damaged during grading, significant adverse health and safety impacts could occur to grading personnel. Grading and construction may be completed in proximity to oil facilities provided the design is in accordance with standards and procedures of the California Division of Oil and Gas and Geothermal Resources (DOGGR).

See Section 3.3, Hydrology and Water Quality, for additional information pertaining to excavated and dredged sediment suitability.

<u>CEQA Impact Determination</u>

As undocumented oil field equipment could be encountered during grading and residual concentrations of various types of hazardous substances may be present in onsite soils and/or groundwater, impacts would be potentially significant. However, because the contractor would remediate and/or dispose undocumented oil field equipment and/or contaminated soil and groundwater encountered during construction in accordance with all federal, state, and local regulations, impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on soil and groundwater contamination would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on soil and groundwater contamination would be less than significant.

<u>NEPA Impact Determination</u>

Impacts associated with undocumented oil field equipment and/or contaminated soil and/or groundwater during grading and construction are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. Consequently, there would be no impacts associated with development of existing backlands, including filling the subsided oil area, under NEPA. Development on proposed fill would not result in exposure of undocumented oil field equipment and/or contaminated soil or groundwater, thus resulting in no soil and groundwater contamination impacts under NEPA.

Mitigation Measures

As impacts on soil and groundwater contamination would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on soil and groundwater contamination would not occur.

Operational Impacts

Impact GEO-6: No active faults are located beneath the Project site.

Earthquakes can potentially cause the greatest operational impacts. The principal damaging effects of earthquakes consist of surface rupture, ground shaking, and liquefaction. The closest active fault, the Palos Verdes Hills Fault, is located approximately three miles from the Project site. There are no known active or potentially active faults crossing the Project area that might result in ground rupture and attendant damage to structures, limiting their use due to safety considerations or physical condition.

CEQA Impact Determination

There are no known active or potentially active faults crossing the Project area that might result in ground rupture and attendant damage to structures, limiting their use due to safety considerations or physical condition. Therefore, impacts associated with seismically induced ground surface rupture would not occur under CEQA.

Mitigation Measures

As impacts of seismically induced ground surface rupture would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts associated with seismically induced ground surface rupture would not occur.

NEPA Impact Determination

There are no known active or potentially active faults crossing the in-water Project area that might result in ground rupture and attendant damage to proposed landfills or overlying structures, limiting their use due to safety considerations or physical condition. Therefore, impacts associated with seismically induced ground surface rupture would not occur under NEPA.

Mitigation Measures

As impacts associated with seismically induced ground surface rupture would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts associated with seismically induced ground surface rupture would not occur.

Impact GEO-7: Seismic activity along numerous regional faults could produce seismic ground shaking, liquefaction, differential settlement, or other seismically induced ground failure that would expose people and structures to greater than normal risk.

An increase in people and new property as a result of increased operations at the Project site would result in a minor increase in the exposure of people and property to seismic hazards as compared to baseline conditions. Strong or intense ground shaking and liquefaction could occur at the Project site, due to the presence of numerous regionally active faults and water-saturated hydraulic fill, consisting of predominantly loose- to medium-dense sand and silt. Earthquake-related hazards, such as liquefaction, ground acceleration, lateral spreading, and differential settlement cannot be avoided in the Long Beach region and in particular in the harbor area where hydraulic and alluvial fill is pervasive.

However, the City of Long Beach Planning & Building Department, Building Code Requirements regulate construction in backland areas of the Port. These building codes and criteria provide requirements for construction, grading, excavations, use of fill, and foundation work, including type of materials, and design, procedures. These codes are intended to limit the probability of occurrence and the severity of consequences from geological hazards, such as earthquakes. Necessary permits, plan checks, and inspections are also specified. The Building Code Requirements also incorporate structural seismic requirements of the California UBC, which classifies almost all of coastal California (including the Project site) within Seismic Zone 4, on a scale of one to four, with four being most severe. The Project engineers would review the Project plans for compliance with the appropriate standards in the building codes.

New wharfs would be designed per the MOTEMS to protect against potential seismic hazards that could occur. These regulations have recently been drafted by the CSLC and adopted as state law. In addition, seismic design would be completed in compliance with Port-wide recommendations established by Earth Mechanics, Inc. (2006). The Port-wide design PGA is 0.50 g for the CLE, with a corresponding dominant source of earthquake M 7.0 on the nearby Palos Verdes Fault (three miles from the Port). Similarly, the design PGA is 0.21 g for the OLE, with a corresponding dominant source of M 6.5, on a fault located at a distance of 12 miles.

CEQA Impact Determination

The Project area is underlain by liquefaction-prone hydraulic fill and is located in proximity to the active Palos Verdes and Newport-Inglewood fault zones. Increased exposure of people and property during operations to seismic hazards from a major or great earthquake cannot be precluded. However, construction in accordance with the City of Long Beach Building Code requirements and State-mandated MOTEMS would limit the probability of occurrence and the severity of consequences from severe seismically induced ground movement during operations. Therefore, impacts associated with seismically induced ground failure would be less than significant under CEQA.

Mitigation Measures

As impacts associated with seismically induced ground failure would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts associated with seismically induced ground failure would be less than significant.

<u>NEPA Impact Determination</u>

Because the proposed in-water Project area would be underlain by liquefaction-prone hydraulic fill, there is a greater than average risk of seismic impacts. Increased exposure of people and property during operations to seismic hazards from a major or great earthquake cannot be precluded. However, construction in accordance with State-mandated MOTEMS would limit the probability of occurrence and the severity of consequences from severe seismically induced ground movement during operations. Therefore, impacts associated with seismically induced ground failure would be less than significant under NEPA.

Mitigation Measures

As impacts associated with seismically induced ground failure would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts associated with seismically induced ground failure would be less than significant under.

Impact GEO-8: Project construction and operation in the Middle Harbor area would not likely expose people and structures to greater than normal risk involving tsunamis or seiches.

Due to the historic occurrence of earthquakes and tsunamis along the Pacific Rim, placement of any development on or near the shore in southern California, including the Project site, would always involve some measure of risk of impacts from a tsunami or seiche. Although relatively rare, should a large tsunami or seiche occur, it would be expected to cause some amount of damage and possibly harm to humans at most on- or near-shore Project locations. As a result, this is considered by the POLB as the average, or normal condition at these locations in southern California. Therefore, a tsunami or seiche related impact in the Project area would be one that would exceed this normal condition and cause substantial damage and/or substantial injuries.

Since tsunamis and seiches are derived from wave action, the risk of damage or injuries from these events at any particular location is lessened if the location is high enough above sea level, far enough inland, or protected by manmade structures such as dikes or concrete walls. The height of a given site above sea level is either the result of an artificial structure (e.g., a dock or wall), topography (e.g., a hill or slope), or both, and a key variable related to the height of a site location relative to sea level is the behavior of tides. During high tide, for instance, the vertical distance between the site and sea level is less than during low tide. How high a site must be located above sea level to avoid substantial wave action during a tsunami or seiche depends upon the height of the tide at the time of the event and the height of the potential tsunami or seiche wave. These factors are considered for the Project site, as described below.

The POLB is subject to diurnal tides, meaning two high tides and two low tides during a 24-hour day. The average of the lowest water level during low tide periods each day is typically set as a benchmark of zero feet and is defined as the MLLW. For purposes of this discussion, all Project structures and land surfaces are expressed as height above (or below) MLLW. The MSL in the Port is +2.8 feet above MLLW (NOAA 2005). This height reflects the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch (19 years) and therefore reflects the mean of both high and low tides in the Port. The recently developed Port Complex model described in Section 3.1.1.2 predicts tsunami wave heights with respect to MSL, rather than MLLW, and therefore can be considered a reasonable average condition under which a tsunami might occur. The Port MSL of +2.82 feet is considered when comparing projected tsunami run-up (i.e., amount of wharf overtopping and flooding) to proposed wharf height and topographic elevations, which are measured with respect to MLLW.

The recently developed Port Complex model predicts tsunami wave heights from a M 7.6 earthquake on the Santa Catalina Fault, a maximum likely seismic scenario for generation of a tsunami or seiche in the San Pedro Bay Ports. The model predicts tsunami wave heights of up to five feet above MSL in the Project area. Incorporating the Port MSL of +2.82 feet, the model predicts tsunami wave heights up to 7.8 feet above MLLW at the Project site. Because the Project site elevation ranges from 10 to 16 feet above MLLW, tsunami-induced flooding would not likely occur under a maximum likely seismic scenario.

While the analysis above considers a maximum likely scenario based on a maximum seismic event, with respect to MSL, a theoretical maximum worst-case wave action from a tsunami would result if the single highest tide predicted over the next 40 years at the San Pedro Bay Ports was present at the time of the seismic event. The single highest tide predicted over the next 40 years is 7.3 feet above MLLW. This condition is expected to occur less than one percent of the time over this 40-year period. If that very rare condition were to coincide with a maximum tsunami event, the model predicts tsunami wave heights up to 12.3 feet above MLLW at the Project site. Because the Project site elevation ranges from 10 to 16 feet above MLLW, localized tsunami-induced flooding of 2.3 feet is possible.

As previously stated, the most likely worst-case tsunami scenario was based on a M 7.6 earthquake on the offshore Santa Catalina Fault. The recurrence interval for a M 7.5 earthquake along an offshore fault in the Southern California Continental Borderland is about 10,000 years. Similarly, the recurrence interval of a M 7.0 earthquake is about 5,000 years and the recurrence interval of a M 6.0 earthquake is about 500 years. However, there is no certainty that any of these earthquake events would result in a tsunami, since only about 10 percent of earthquakes worldwide result in a tsunami. In addition, available evidence indicates that tsunamigenic landslides would be extremely infrequent and occur less often than large earthquakes. This suggests recurrence intervals for such landslide events would be longer than the 10,000 year recurrence interval estimated for a M 7.5 earthquake (Moffatt & Nichol 2006a).

<u>CEQA Impact Determination</u>

Due to the historic occurrence of earthquakes and tsunamis along the Pacific Rim, placement of any development on or near the shore in southern California, including the Project site, would always involve some measure of risk of impacts from a tsunami or seiche. Designing new facilities based on existing building codes may not prevent substantial damage to structures from coastal flooding. Impacts due to seismically induced tsunamis and seiches are typical for the entire California coastline and would not be increased by construction of the proposed Project. However, because the Project elevation is located within 10 to 16 feet above MLLW, there is a risk of coastal flooding due to tsunamis and seiches. Regardless, the likelihood of such an occurrence is extremely low. As a result, impacts would be less than significant under CEQA.

Mitigation Measures

As impacts associated with tsunamis and seiches would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts associated with tsunamis and seiches would be less than significant.

<u>NEPA Impact Determination</u>

Due to the historic occurrence of earthquakes and tsunamis along the Pacific Rim, placement of any development on or near the shore in southern California, including the Project site, would always involve some measure of risk of impacts from a tsunami or seiche. Designing new facilities based on existing building codes may not prevent substantial damage to structures from coastal flooding. Impacts due to seismically induced tsunamis and seiches are typical for the entire California coastline and would not be increased by construction of the proposed Project. However, because the Project elevation is located within 10 to 16 feet above MLLW, there is a risk of coastal flooding due to tsunamis and seiches. Regardless, the likelihood of such an occurrence is extremely low. As a result, impacts would be less than significant under NEPA.

Mitigation Measures

As impacts associated with tsunamis and seiches would be less than significant, no mitigation measures are necessary.

Significance of Impacts after Mitigation

Impacts associated with tsunamis and seiches would be less than significant.

3.1.2.4 Alternative 2 – 315-Acre Alternative

Alternative 2 would add 24.7 net acres of newly created land to the existing 294-acre Project site by filling Slip 1 between Piers E and F (Berths E12-E14 and F1-F4). Under this alternative, the proposed East Basin would not be filled.

<u>CEQA Impact Determination</u>

Under this alternative, impacts on geology, groundwater, and soils would be similar in nature to, but slightly less than those described under **Impacts GEO-1 through GEO-8** for the Project because the extent of construction activity causing short-term impacts and extent of new Project structures and infrastructure would be reduced with the elimination of the fill of the East Basin. As with the Project, implementation of Alternative 2 would result in less than significant impacts under CEQA.

<u>NEPA Impact Determination</u>

Under this alternative, impacts on geology, groundwater, and soils would be similar in nature to, but slightly less than those described under **Impacts GEO-1 through GEO-8** for the Project because the extent of in-water construction activity causing short-term impacts and extent of new Project structures and infrastructure on newly created land resulting in long-term impacts would be reduced with the elimination of the fill of the East Basin. As with the Project, implementation of Alternative 2 would result in less than significant impacts under NEPA.

3.1.2.5 Alternative 3 – Landside Improvements Alternative

Alternative 3 would redevelop existing terminal areas on Piers E and F and convert underutilized land north of the Gerald Desmond Bridge and Ocean Boulevard within the Project site to a container yard. No in-water activities, including dredging, filling Slip 1 and the East Basin, new wharf construction, wharf upgrades, or channel and berth deepening would occur.

<u>CEQA Impact Determination</u>

Construction impacts related to geology, groundwater, and soils would be similar in nature to, but slightly less than those described under **Impacts GEO-1 through GEO-5** for the Project. This is because of the reduced extent of construction activity that could cause relatively short-term impacts, based on elimination of the fill in the East Basin while considering the 18 acres of backland that would be redeveloped compared to the Project. Operational impacts also would be similar, but slightly less than those described under **Impacts GEO-6 through GEO-8,** as the extent of new Project structures and infrastructure, which would be susceptible to seismically induced ground failure, would be reduced compared to the Project. Therefore, implementation of Alternative 3 would result in less than significant impacts under CEQA.

<u>NEPA Impact Determination</u>

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on geology, groundwater, and soils would occur.

3.1.2.6 Alternative 4 – No Project Alternative

The No Project Alternative would not include construction of upland site improvements, including rail improvements and construction of the Pier E Substation, or in-water activities (i.e., dredging, filling of Slip 1 and the East Basin, and/or new wharf construction). However, forecasted increases in cargo would still occur under this alternative. Operational impacts associated with following activities would occur: cargo ships that currently berth and load/unload at the terminal would continue to do so; terminal equipment would continue to handle cargo containers; and trucks would continue to transport containers to outlying distribution facilities.

<u>CEQA Impact Determination</u>

No new construction would occur under this alternative; therefore, construction related **Impacts GEO-1 through GEO-5** would not occur. Effects from **Impact GEO-6** would not occur, as no active faults traverse the No Project Alternative site. However, the existing 294-acre site would continue to be subject to seismically induced ground failure, tsunamis, and seiches. Therefore, operations related **Impacts GEO-7 and GEO-8** would apply to this alternative under CEQA. As with the Project, implementation of this alternative would result in less than significant impacts under CEQA.

NEPA Impact Determination

No new construction would occur under this alternative; therefore, construction related **Impacts GEO-1 through GEO-5** would not occur. Also, **Impact GEO-6** would not occur, as no active faults traverse the No Project Alternative site. However, the existing site would continue to be subject to seismically induced ground failure, tsunamis, and seiches; therefore, operational **Impacts GEO-7 and GEO-8** would apply to this alternative under NEPA. As with the Project, implementation of this alternative would result in less than significant impacts under NEPA.

3.1.3 Cumulative Impacts

All projects located in the POLB and POLA are subject to severe seismically induced ground shaking due to an earthquake on a local or regional fault. Structural damage and risk of injury are possible for all cumulative projects listed in Table 2.1-1, with the exception of the Channel Deepening Project, Pier A West Remediation Project, the Artificial Reef Project, and the Pan-Pacific Cannery Complex Demolition Project, as these projects do not involve existing or proposed structural engineering. Seismic-related impacts at the Project site, in combination with probable future projects, would remain less than significant with incorporation of modern construction engineering and safety standards, under both NEPA and CEQA. The Project's contribution to cumulative impacts is similarly less than significant, under both NEPA and CEQA, with incorporation of modern construction engineering and safety standards.

Likewise, all projects located in the POLB and POLA are subject to coastal inundation as a result of a large tsunami. Structural damage and risk of injury as a result of such a tsunami are possible for most structures, improvements, and onsite personnel that would be associated with cumulative projects listed in Table 2.1-1, with the exception of the Channel Deepening Project, Pier A West Remediation Project, the Artificial Reef Project, and the Pan-Pacific Cannery Complex Demolition Project, as these projects do not involve existing or proposed structural engineering or onsite personnel. However, tsunami- related impacts at the Project site, in combination with probable future projects, would result in adverse, but less than significant cumulative impacts under NEPA and CEQA, due to the low probability of such a tsunami. Similarly, the Project's cumulative contribution would be adverse, but less than significant under NEPA and CEQA, due to the low probability of such a tsunami.

All cumulative projects in the POLB and POLA involving grading, excavations, and construction/ demolition would be considered within the region of influence for impacts associated with erosion-induced sedimentation of harbor waters and potential encounters with contaminated soil. Such projects would include all those listed in Table 2.1-1, with the exception of the Channel Deepening Project, Artificial Reef Project, and Berths 206-209 Interim Container Terminal Reuse Project, as these projects do not involve ground disturbance associated with new construction, demolition, or remediation.

Construction at probable future Project sites involving grading and construction, in combination with construction for the Project, would result in adverse, but less than significant cumulative erosional impacts on harbor water quality under NEPA and CEQA, due to implementation of a SWPPP and construction BMPs. Similarly, the Project's cumulative contribution to erosion induced sedimentation of harbor waters would be adverse, but less than significant under NEPA and CEQA, due to implementation of a SWPPP and construction BMPs.

Impacts associated with potentially encountering contaminated soil at probable future Project sites involving grading and construction, in combination with construction for the Project, would result in adverse, but less than significant cumulative impacts under NEPA and CEQA, as such impacts are generally localized and confined to the immediate area of contamination. Similarly, the Project's cumulative contribution to impacts would be adverse, but less than significant under NEPA and CEQA, as such impacts are generally localized and confined to the immediate area of contamination.

3.1.4 Mitigation Monitoring Program

As no mitigation measures are required to address impacts on geology, groundwater, and soils resources, no mitigation monitoring program is required.

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3.2 AIR QUALITY AND HEALTH RISK

Note: All referenced tables within this section can be found starting on page 3.2-97.

This section addresses the potential impacts on air quality and human health that could result from implementation of the Project and alternatives.

Summary of Updates to the Draft EIS/EIR Air Quality Analyses

Subsequent to release of the Draft EIS/EIR in May 2008, new regulations were adopted and several updated assumptions became available that were used to prepare an updated air quality analysis for the Final EIS/EIR. The following summarizes these revisions and their effects on the results of the air quality analyses presented in the Draft EIS/EIR:

1. In comparison to the Draft EIS/EIR, the updated analyses included in the Final EIS/EIR did not identify any new significant air quality impacts for any alternatives.

2. For all analyzed Project years, the differences in the net change in peak daily sulfer oxide (SO_x) operational emissions between the mitigated Project and NEPA Baseline changed from a significant impact in the Draft EIS/EIR to an insignificant impact in the Final EIS/EIR, mainly due to implementation of low sulfur fuel regulation and revised mitigation measures. Similar changes occur for the other Project alternatives.

3. For years 2020 and 2030 analyses, the differences in the net change in annual average daily carbon monoxide (CO) operational emissions between the mitigated Project and NEPA Baseline changed from significant impacts in the Draft EIS/EIR to insignificant impacts in the Final EIS/EIR, namely due to updated vehicle miles traveled (VMT) data and updated emission factors. Similar changes occur for the other Project alternatives.

4. For year 2015 analyses, the differences in the net change in annual average daily volatile organic compound (VOC) operational emissions between the mitigated Project and NEPA Baseline changed from a significant impact in the Draft EIS/EIR to an insignificant impact in the Final EIS/EIR. This was due to updated VMT and updated emission factors. Similar changes occur for the other Project alternatives.

5. The mitigated Project cancer risk under NEPA for occupational receptors was reduced from significant to less than significant levels.

Construction Impacts

<u>Construction Tugboats</u>

1. **Mitigation Measure AQ-3** requires all tugboats used in construction to meet EPA Tier 2 marine engine standards, and if feasible construction tugs should meet the EPA Tier 3 marine engine standards. The Draft EIS/EIR air quality analysis did not reflect the emission reductions associated with this measure. Rather, for the unmitigated scenario, it simulated the turnover of the South Coast Air Basin (SCAB) tugboat fleet due to implementation of the California Air Resources Board (ARB) Commercial Harbor Craft Regulation. This regulation assumes that with time the POLB harbor craft fleet would turn over to engines that meet EPA Tiers 2 through 4 standards. The composite emission factors developed by the ARB for use in the regulation show that emissions from the average SCAB harbor craft fleet would decrease during each year of Project construction. The air quality analyses in Section 3.2 of the Final EIS/EIR did not change from this approach. However, the Project conformity determination presented in Appendix A-4 simulated **Mitigation Measure AQ-3** by assuming implementation of Tier 2 standards on construction tugboats at the inception of construction until the SCAB average composite fleet factors would drop below these emission levels. This would occur by year 2013 (see the tugboat emission factors in Appendix A-1, Table A.1.1-Alt 1-42).

2. Table 3.2-2, which shows the most recent five-year period of ambient pollutant data collected at the SCAQMD North Long Beach monitoring station, was updated with data for years 2007 and 2008. Updated maximum one-hour and annual nitrogen dioxide (NO_2) background values were used to update the dispersion modeling analyses results in **Impacts AQ-2 and AQ-4**. This revision resulted in the elimination of the significant one-hour NO_2 construction impact identified in the Draft EIS/EIR

(Tables 3.2-14 and 3.2-15), and no changes in the significance determinations for operational emissions identified in the Draft EIS/EIR (Tables 3.2-20 and 3.2-21).

Operational Impacts

Ocean-Going Vessels (OGV)

1. Project OGV would comply with the ARB Fuel Sulfur Regulation under the following scenarios:

- Unmitigated Project Scenarios – All OGV sources would use 1.5 percent sulfur fuel in year 2010 and 0.1 percent sulfur starting in year 2012 and thereafter. The unmitigated scenarios in the Draft EIS/EIR assumed the use of 0.2 percent sulfur fuel in all Project years. This has been updated in the Final EIS/EIR.
- Mitigated Project Scenarios – All OGV sources would use 0.1 percent sulfur fuel in year 2012 and thereafter. Prior to 2012, OGV would comply with **Mitigation Measure AQ-6,** which requires use of 0.2 percent sulfur diesel.

2. Updated ARB emission factors for diesel fuel used in the technical analyses that support the above regulation were adopted (ARB 2008b). This revision produced nominal changes to the OGV emissions estimates.

3. Changes to Draft EIS/EIR analyses – The annual average and peak daily unmitigated and mitigated emissions and the unmitigated and mitigated cancer risk analyses for each Project scenario were updated. The updates resulted in minimal changes in the emissions, except for $SO_{x.}$ However, there are no requirements for SO_x modeling. The criteria pollutant modeling analysis for CO, NO_2, particulate matter (PM) less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) was not updated, since the changes described above would have almost no effect on modeling results of the mitigated 2010 peak emissions scenario that was evaluated under **Impact AQ-4**, and, therefore, the significance findings in the Final EIS/EIR are the same as those noted in the Draft EIS/EIR.

Locomotives

1. EPA Locomotive Emission Standards – Based on EPA's assumptions for remanufacturing locomotives, such as line haul and switch locomotives that would serve the Project railyard, the Final EIS/EIR was updated to assume that transport locomotives would achieve the equivalent of Tier 3 standards beginning in 2025.

2. Changes to Draft EIS/EIR analyses – The annual average and peak daily unmitigated and mitigated emissions and unmitigated and mitigated cancer risk analyses were updated for each Project scenario. The criteria pollutant modeling analysis was not updated, as these changes would not take effect until 2025, which is after the year 2010 (peak year) scenarios evaluated under **Impact AQ-4**.

On-Road Vehicles – Criteria Pollutants

1. Criteria pollutant emissions from off-terminal operational truck and auto activity emissions – Due to a tabulation error by a Port contractor other than the preparer of this document that was discovered by the preparer of this document after the release of the Draft EIS/EIR, incorrect VMT data were used in the Draft EIS/EIR analyses for emission calculations of off-terminal operational truck and auto activity emissions for each Project scenario. The emission calculations have been corrected in the Final EIS/EIR.

2. Changes to Draft EIS/EIR analyses – The corrected analyses show that daily vehicle emissions for the CEQA Baseline decreased slightly and future Project scenarios increased by approximately 100 percent in 2010 and by substantially lower amounts in post-2010 (within SCAB region) compared to those presented in the Draft EIS/EIR. As a result, revisions were made to the annual average and peak daily unmitigated and mitigated emissions for each Project scenario. These revisions in VMT did not affect the Project criteria dispersion modeling analyses or health risk assessment (HRA) as those analyses used separate and correct hourly and annual vehicular data subsets.

On-Road Vehicles – Greenhouse Gases (GHG)

1. The Draft EIS/EIR assumed that each truck trip generated by the Project terminal would

travel a distance equal to the average of a local trip length and the trip distance between the POLB and the California/Arizona border (POLA and USACE 2007). Subsequent to the Draft EIS/EIR, new traffic analyses more accurately identified the number of POLB-generated truck trips that enter/leave the SCAB and California, and their associated origins/destinations.

2. Changes to Draft EIS/EIR analyses – Revisions were made to the annual greenhouse gases (GHG) emissions for all future Project scenarios. The revisions resulted in substantial reductions in truck VMT for future Project scenarios within the California analysis region. The corrected analyses show that annual vehicle emissions for the CEQA Baseline decreased slightly and future Project scenarios decreased substantially for all future Project scenarios within the SCAB region and California.

3. For the reasons mentioned above under criteria pollutants, use of corrected VMT data for commuter vehicles resulted in a reduction in GHG emissions for these sources for the CEQA Baseline compared to those presented in the Draft EIS/EIR

Evaluation of New Mitigation Measures

1. The Final EIS/EIR includes 16 new mitigation measures in addition to those proposed in the Draft EIS/EIR (see Section 3.2.4).

2. Changes to Draft EIS/EIR analyses – The emission reductions due to implementation of **Mitigation Measure AQ-7a,** High Efficiency Rail Mounted Gantry (RMG) Cranes, in year 2020, were quantified for mitigated annual average and peak daily emissions, annual mitigated GHG emissions, and the mitigated cancer risk analyses for all Project scenarios. This resulted in a reduction in daily and annual emissions in 2020 and 2030 and minimal effects on **Impact AQ-6** (HRA results).

New Analyses Not Included in Draft EIS/EIR

1. Peak Day Emissions of Combined Operational and Construction Activities – At the request of the SCAQMD, the Final EIS/EIR includes an analysis of the peak daily emissions associated with overlapping operational and mitigated construction activities that would occur from the Project and alternatives between years 2009 and 2019. This analysis also verified that 2010 is the year that the Project would produce the highest combined construction and operational emissions and therefore ambient impacts evaluated in **Impact AQ-4**. The results of these analyses are presented in response to comment SCAQMD-2 in Chapter 10.

2. New Peak Day Emission Scenarios for NEPA and CEQA Baselines – In support of the peak day emissions analyses, the annual average daily scenarios for the NEPA and CEQA Baselines used in the Draft EIS/EIR to evaluate proposed peak daily emissions were replaced with peak day emissions scenarios. This new approach was conducted to provide a more representative evaluation for comparison of peak baseline to peak future conditions.

3. The Project HRA evaluated additional schools that are within the Long Beach Unified School District (LBUSD) jurisdiction. These school locations were further away from the Project terminal than the nearest schools evaluated in the Draft EIS/EIR. The results of the Final EIS/EIR HRA analysis showed that the health impacts at these new school locations would be less than the maximum health impacts identified for all sensitive receptor locations (which include all LBUSD schools).

4. World-wide GHG Emission Calculations – At the request of the California Department of Justice (DOJ), the Final EIS/EIR estimates annual GHG emissions from each Project scenario that would occur from the transport of cargo between the Middle Harbor terminal and the first point of rest, regardless of whether this point is within or outside California. Assumptions used in the analysis and a summary of these emission estimates are included in response to comment DOJ-4 in Chapter 10.

5. Black Carbon – Section 3.2.1.2 describes the potential effects of climate change from black carbon. The analysis of **Impact AQ-8** also evaluates the effects of Project emissions of black carbon and DPM on climate change.

6. Draft Conformity Determination – Final EIS/EIR Appendix A-4 contains the conformity applicability analysis and

conformity determination for the federal action involving in-water construction activities that fall under USACE jurisdiction for Alternatives 1 and 2. These analyses show that proposed emissions would conform to the most recent federally-approved State Implementation Plan (SIP), as required under EPA's General Conformity Regulation (40 CFR Part 93 Subpart B) and SCAQMD Rule 1901. Table 3.2-4 was updated in the Final EIS/EIR to only account for the emissions from the federal action portion of Alternatives 1 and 2.

Comparison of Final EIS/EIR and Draft EIS/EIR Results

Tables 3.2-60 through 3.2-63, presented at the end of Section 3.2, provide a comparison of the emissions and modeling HRA results presented in the Draft EIS/EIR and Final EIS/EIR for Alternative 1. Tables 3.2-64 through 3.2-66, also presented at the end of Section 3.2, provide a comparison of the annual average and peak daily emissions presented in the Draft EIS/EIR and Final EIS/EIR for Alternatives 2, 3, and 4.

Table 3.2-60 provides a comparison of the projected mitigated annual average daily and peak daily Project NEPA and CEQA emissions increments in the Draft EIS/EIR (Tables 3.2-18 and 3.2-19) and the Final EIS/EIR (Tables 3.2-20 and 3.2-21). Also noted are any differences in significance determinations between the Draft EIS/EIR and Final EIS/EIR with regard to the mitigated average and peak daily emissions. Importantly, these revisions did not result in any new significant impacts that were not identified in the Draft EIS/EIR for Alternative 1, and in a few cases, resulted in elimination of some of the significant impacts in the Draft EIS/EIR: (1) for annual average daily emissions compared to the NEPA Baseline (namely for VOC for 2015 and CO for 2020 and 2030); and (2) for peak daily emissions compared to the NEPA Baseline (namely for CO, SO_x, and $PM_{2.5}$ for all analyzed years).

Tables 3.2-64 provides a comparison of the projected mitigated annual average daily and peak daily Alternative 2 NEPA and CEQA emissions increments in the Draft EIS/EIR (Tables 3.2-34 and 3.2-35) and the Final EIS/EIR (Tables 3.2-36 and 3.2-37). The table shows similar conclusions for Alternative 2 as those described above for Alternative 1. Updates to the Alternative 2 analyses did not result in any new significant impacts that were not identified in the Draft EIS/EIR, and in a few cases, resulted in elimination of significant impacts in the Draft EIS/EIR: (1) for annual average daily emissions compared to the NEPA Baseline (namely for VOC for 2015, 2020, and 2030 and nitrogen oxides (NO_x) for 2010 and 2020); and (2) for peak daily emissions compared to the NEPA Baseline (namely for VOC, CO, SO_x, and PM_{10} for all analyzed years).

Table 3.2-65 provides a comparison of the projected annual average daily and peak daily Alternative 3 CEQA emissions increments in the Draft EIS/EIR (Tables 3.2-46 and 3.2-47) and the Final EIS/EIR (Tables 3.2-48 and 3.2-49). Updates to the Alternative 3 analyses did not result in any new significant impacts that were not identified in the Draft EIS/EIR, and they remain insignificant for all pollutants.

Tables 3.2-66 provides a comparison of the projected annual average daily and peak daily Alternative 4 CEQA emissions increments in the Draft EIS/EIR (Tables 3.2-52 and 3.2-53) and the Final EIS/EIR (Tables 3.2-54 and 3.2-55). Updates to the Alternative 4 analyses did not result in any new significant impacts that were not identified in the Draft EIS/EIR, and they remain insignificant for all pollutants.

Comparison of Draft EIS/EIR and Final EIS/EIR CEQA Analysis Results

There are no significant changes in the Final EIS/EIR results as compared to the Draft EIS/EIR with respect to any of the CEQA significance findings for **Impacts AQ-1 through AQ-8**.

For annual average daily operational emissions, the Final EIS/EIR analysis for 2010 (Table 3.2-20) showed increases in the mitigated average daily CEQA emissions increments for all pollutants (VOC = -95; CO = -784; NO_x = -3325; SO_x = -2698; PM_{10} = -565; $PM_{2.5}$ = -515, all in pounds per day) as compared to those presented in the results in Table 3.2-18 of the Draft EIS/EIR (VOC = -410; CO = -4585; NO_x = -6743; SO_x = -2260; PM_{10} = -607; $PM_{2.5}$ = -561, all in pounds per day), mainly due the VMT data tabulation errors described above. The increases in mitigated average daily CEQA increment values are from the relatively large negative CEQA increments in the Draft EIS/EIR to somewhat large negative CEQA increments in the Final EIS/FIER. However, the updated CEQA increment values for average daily emissions for all years analyzed remain below the significance thresholds for all pollutants.

Comparison of the Project's peak daily CEQA emission increments identified in the Final EIS/EIR

(Table 3.2-21) to those presented in the Draft EIS/EIR (Table 3.2-19) show similar conclusions as described above for annual average daily emissions. The updated CEQA increment values for peak daily emissions all remain below significance thresholds for all pollutants, for all years analyzed.

Table 3.2-61 provides a comparison of the GHG (carbon dioxide equivalent [CO_2e]) emission estimates for the NEPA and CEQA Baselines for the Project as presented in the Final EIS/EIR and the Draft EIS/EIR. For the CEQA Baseline, for all years, the Final EIS/EIR (Table 3.2-7) shows emissions numbers which are eight percent smaller than those presented in the Draft EIS/EIR (Table 3.2-6).

Table 3.2-62 provides a comparison of the GHG (CO_2e) emission estimates for the NEPA and CEQA increments for the mitigated Project as presented in the Draft EIS/EIR and the Final EIS/EIR. For the mitigated Project, the CEQA increments identified in the Final EIS/EIR (Table 3.2-30) show CO_2e emissions increments which are 65 to 88 percent smaller those presented in the Draft EIS/EIR (Table 3.2-28), for all years.

With respect to ambient impacts based on dispersion modeling there are no significant differences in the results except for updates to the impacts results based on the latest background monitoring data discussed above.

Comparison of Draft EIS/EIR and Final EIS/EIR NEPA Analysis Results

A comparison of NEPA increments for the mitigated annual average daily operational emissions presented in the Draft EIS/EIR (Table 3.2-18) and the Final EIS/EIR (Table 3.2-20) is shown in Table 3.2-60. Differences in the net change in average daily operational emissions between the mitigated Project and the NEPA Baseline between the Draft EIS/EIR and Final EIS/EIR include the following: VOC emissions in 2015 and CO emissions in 2020 and 2030 changed from being significant in the Draft EIS/EIR to being insignificant in the Final EIS/EIR.

A comparison of the NEPA increments for the mitigated peak daily operational emissions presented in the Final EIS/EIR (Tables 3.2-21) and the Draft EIS/EIR (Tables 3.2-19) is shown in Table 3.2-60. Differences in the net change in peak daily operational emissions between the mitigated Project and the NEPA Baseline between the Draft EIS/EIR and Final EIS/EIR include the following: CO, SO_x, and $PM_{2.5}$ emissions in all years changed from being significant in Draft EIS/EIR to being insignificant in the Final EIS/EIR, mainly due to implementation of low sulfur fuel mitigation measures.

Table 3.2-61 provides a comparison of the GHG (CO_2e) emission estimates for the NEPA and CEQA Baselines for the Project as presented in the Draft EIS/EIR and the Final EIS/EIR. For the NEPA Baseline the Final EIS/EIR (Table 3.2-14) shows emissions numbers which are about one-half those presented in the Draft EIS/EIR (Table 3.2-12).

Table 3.2-62 provides a comparison of the GHG (CO_2e) emission estimates for the NEPA and CEQA increments for the mitigated Project as presented in the Final EIS/EIR and the Draft EIS/EIR. For the mitigated Project, the NEPA increments identified in the Final EIS/EIR (Table 3.2-30) show CO_2e emissions increments which range from an increase of 12 percent for 2020 to a decrease of 95 percent from the results presented in the Draft EIS/EIR (Table 3.2.28) for all years.

Comparison of Draft EIS/EIR and Final EIS/EIR HRA Results

The Final EIS/EIR includes an updated cancer risk analysis for the proposed Project and alternatives. Much like the Draft EIS/EIR, the Final EIS/EIR shows that Project-specific cancer, acute, and chronic risk impacts would be insignificant for all Project alternatives under both NEPA and CEQA. However, the mitigated Project cancer risk under NEPA for occupational receptors was reduced from significant to less than significant levels. Since the analysis addresses NEPA (Project minus NEPA) and CEQA (Project minus CEQA) increments in most instances the maximum impacts locations changed from the Draft EIS/EIR. The results of these analyses are presented under **Impact AQ-6**.

Table 3.2-63 provides a comparison of the maximum NEPA and CEQA increment heath risk impacts results as presented in the Final EIS/EIR and the Draft EIS/EIR. For the CEQA increment, the Final EIS/EIR (Table 3.2-25) shows maximum cancer health risk values which are less than those presented in the Draft EIS/EIR (Table 3.2-23). These results indicate that the cancer impacts remain insignificant. There were no differences in the CEQA increment chronic and acute health impact results presented in the Final EIS/EIR and the Draft EIS/EIR.

Table 3.2-63 shows that for the NEPA increment the Final EIS/EIR (Table 3.2-25), the maximum residential NEPA increment cancer risk value is higher than identified in the Draft EIS/EIR (Table 3.2-23). However the new maximum risk value remains below the significance threshold. As shown in Table 3.2-63, the maximum cancer risk NEPA increment results for occupational and sensitive receptors are lower in the Final EIS/EIR than the Draft EIS/EIR. There were no differences in the NEPA increment chronic and acute health impact results presented in the Final EIS/EIR and the Draft EIS/EIR.

3.2.1 Environmental Setting

3.2.1.1 Area of Influence

The POLB is located within the SCAB. Emissions from construction and operation of the proposed Project would affect air quality in the immediate Project area and the surrounding region.

The air quality area of influence for the proposed Project includes the SCAB, which consists of the urbanized areas of Los Angeles, Riverside, San Bernardino, and Orange Counties, and the ocean offshore of the South Coast Waters. The SCAB onshore area covers approximately 6,000 square miles. Figure 3.2-1 shows the Project air quality area of influence. The SCAQMD has the authority to regulate stationary sources of air pollution in the SCAB. The area of influence also includes the Project's zone of impact (ZOI) for health risk purposes, which is defined as the area within the one-in-a-million isopleths of health risk increment.

3.2.1.2 Setting

The proposed Project site is located in the in the southwest coastal area of the SCAB and within the Middle Harbor, the Northeast Harbor, and the Southeast Harbor Planning Districts of the POLB.

The following section describes the climate/ meteorology of the Project area, the regulations that apply to the Project, criteria for determining the significance of impacts, the potential impacts associated with the Project, and the mitigation measures proposed to reduce these impacts.

Regional Climate and Meteorology

The climate of the Project region is classified as Mediterranean, which is characterized by cool, dry summers and mild winters. The major influences on the regional climate are the Eastern Pacific High, a strong, persistent high-pressure system, and the moderating effects of the Pacific Ocean. Seasonal variations in the position and strength of the Eastern Pacific High are key factors in weather changes for the area.

The Eastern Pacific High attains its greatest strength and most northerly position during the summer, when it is centered west of northern California. In this location, this high effectively shelters southern California from the effects of polar storm systems. Large-scale atmospheric subsidence associated with the high produces an elevated temperature inversion along the West Coast. The base of this subsidence inversion is generally 1,000 to 2,500 feet above MSL during the summer. Vertical mixing is often limited to the base of the inversion and air pollutants are trapped in the lower atmosphere. The mountain ranges that surround the SCAB constrain the horizontal movement of air and also inhibit the dispersion of air pollutants out of the region. These two factors, combined with the air pollution sources from over 15 million people, are responsible for the high pollutant conditions that can occur in the SCAB. In addition, high solar radiation during the warmer months promotes the formation of ozone, which has its highest concentration levels during the summer season.

Marine air trapped below the base of the subsidence inversion is often condensed into fog and stratus clouds by the cool Pacific Ocean. This is a typical weather condition in the San Pedro Bay region during the warmer months of the year. Stratus clouds usually form offshore and move into the coastal plains and valleys during the evening hours. Clouds burn-off to the immediate coastline when the land heats-up the following morning, but often reform again the following evening.

The proximity of the Eastern Pacific High and a thermal low pressure system in the desert interior to the east produce a sea breeze regime that prevails within the Project region for most of the year, particularly during the spring and summer months. Sea breezes at the Port typically increase during the morning hours from the southerly direction and reach a peak in the afternoon as they blow from the southwest. These winds generally subside after sundown. During the warmest months of the year, however, sea breezes could persist well into the nighttime hours. Conversely, during the colder months of the year, northerly land breezes increase by sunset and into the evening hours. Sea breezes transport air pollutants away from the coast and towards the interior regions in the afternoon hours for most of the year.

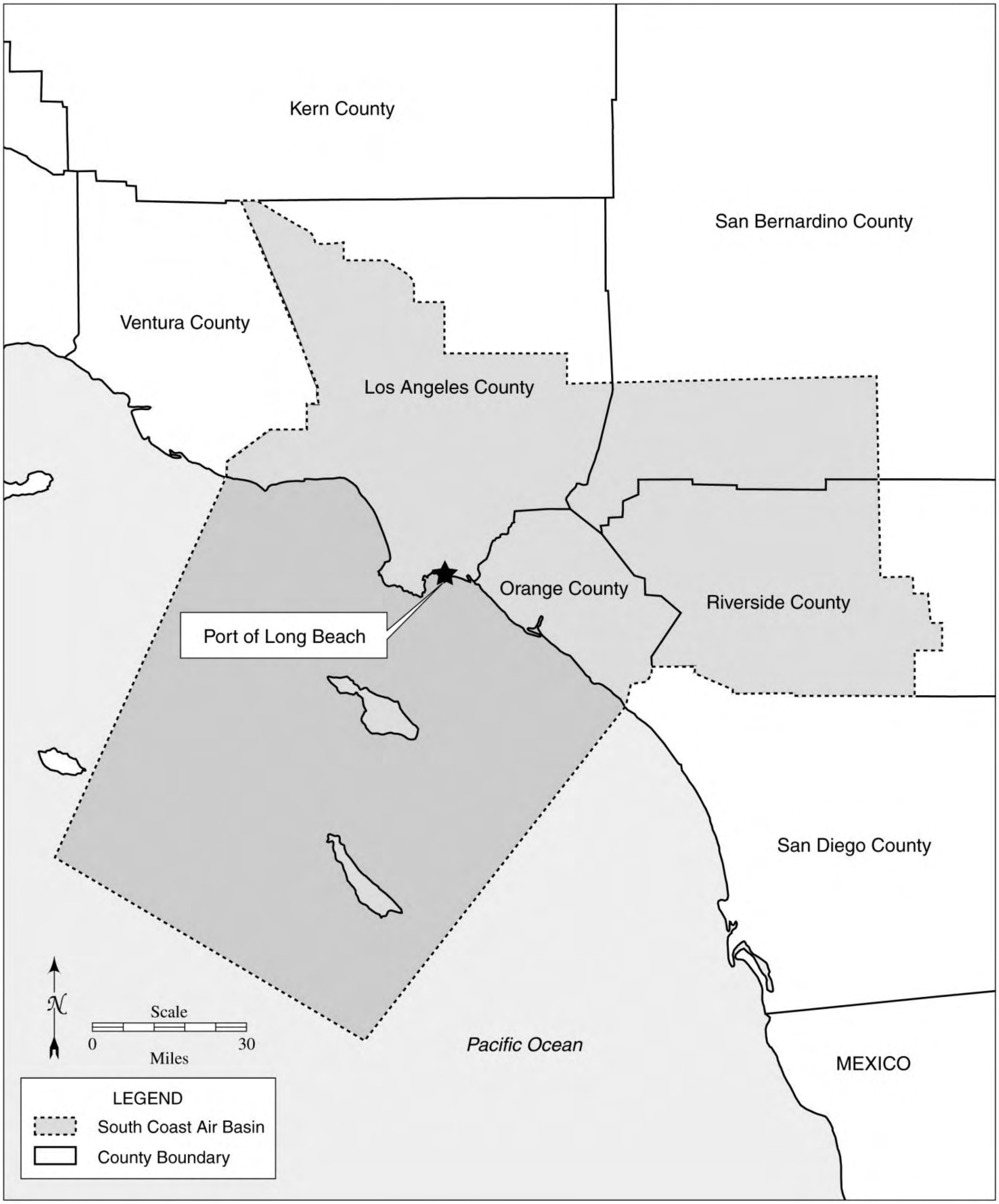

Figure 3.2-1. Middle Harbor Air Quality Region of Influence

During fall and winter months, the Eastern Pacific High can combine with high pressure over the continent to produce light winds and extended inversion conditions in the region. These stagnant atmospheric conditions often result in elevated pollutant concentrations in the SCAB. Excessive buildup of high pressure in the Great Basin region can produce a "Santa Ana" condition, characterized by warm, dry, northeast winds in the basin and offshore regions. Santa Ana winds often help clear the SCAB of air pollutants.

The Palos Verdes Hills have a major influence on wind flow in the San Pedro Bay (SCAQMD 1977). For example, during afternoon southwest sea breeze conditions the Palos Verdes Hills often block this flow and create a zone of lighter winds in the inner harbor area of the Port. During strong sea breezes this flow can bend around the north side of the Palos Verdes Hills and end up as a northwest breeze in the inner harbor area. This topographic feature also deflects northeasterly land breezes that flow from the coastal plains to a more northerly direction through the ports.

As winter approaches, the Eastern Pacific High begins to weaken and shift to the south, allowing storm systems to pass through the region. The number of days with precipitation varies substantially from year to year, which produces a wide range of variability in annual precipitation totals. The annual precipitation for Long Beach Airport, approximately six miles northeast of the Project site, ranged from 2.6 to 27.7 inches from 1958 through 2006, with an average of 12.1 inches (Western Regional Climate Center 2007). About 94 percent of the annual rainfall occurs during the months of November through April, with a monthly average maximum of three inches in February. This wet-dry seasonal pattern is characteristic of most of California. Infrequent precipitation during the summer months usually occurs from tropical air masses that originate from continental Mexico or tropical storms off the West Coast of Mexico.

The average high and low air temperatures at Long Beach Airport in August are 84°F and 65°F, respectively. January average high and low temperatures are 67°F and 46°F. Extreme high and low temperatures recorded from 1958 through 2006 were 111°F and 25°F, respectively (Western Regional Climate Center 2007). Temperatures in the San Pedro Bay area are generally less extreme than inland regions, due to the moderating effect of the ocean.

Air Pollutants and Monitoring Data

Air pollutants are defined as two general types: (1) "criteria" pollutants, representing pollutants for which national and state ambient air quality standards have been set based on health protection and welfare considerations; and (2) toxic compounds, which are referred to as a hazardous air pollutant (HAP) by the federal government and as a toxic air contaminant (TAC) by the State of California. TACs are pollutants that have been determined to pose potential cancer or non-cancer (acute or chronic) health risks to the general public. Units of concentration for both of these types of air pollutants are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

Criteria Pollutants

Air quality at a given location can be described by the concentrations of various air pollutants in the atmosphere. The significance of a pollutant concentration is determined by comparing the pollutant's concentration to an appropriate national and/or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which the public health and welfare are protected and include a reasonable margin of safety to protect the more sensitive individuals in the population.

The EPA establishes the National Ambient Air Quality Standards (NAAQS) that regulate the following criteria pollutants: ozone (O_3); CO; NO_2; sulfur dioxide (SO_2); PM_{10}; $PM_{2.5}$; and lead. Maximum pollutant concentrations generally shall not exceed a short-term NAAQS more than once per year and they shall not exceed the annual standards on average over three years.

The state standards, established by the ARB, are termed the California Ambient Air Quality Standards (CAAQS). California standards for O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$ are values not to be exceeded. All other standards are not to be equaled or exceeded. The NAAQS (EPA 2008a) and CAAQS (ARB 2007) are presented in Table 3.2-1.

The federal eight-hour O_3 standard is attained when the measured average of the annual fourth-highest daily maximum eight-hour average concentration is less than or equal to 0.075 ppm. For CO, the eight-hour and one-hour federal standards of nine and 35 ppm, respectively, are not to be exceeded more than once per year. The federal NO_2 standard is attained when the annual arithmetic mean concentration in a calendar year is less than or equal to 0.053 parts per million (rounded to three decimal places). For SO_2, the annual federal standard is attained if the annual arithmetic mean concentration is less than or equal to 80 µg/m^3. The three-hour and 24-hour SO_2 standards of 1,300 and 365 µg/m^3, respectively, are not to be exceeded more than once per year. The federal PM_{10} standards are attained when the annual arithmetic mean concentration is less than or equal to 50 µg/m^3, and when the 99th percentile 24-hour concentration is less than or equal to 150 ug/m^3. The federal $PM_{2.5}$ standards are attained when the annual arithmetic mean concentration is less than or equal to 15.0 µg/m^3 and when the 98th percentile 24-hour concentration is less than or equal to 65 µg/m^3.

The criteria pollutants of primary concern that are assessed in this EIS/EIR include O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. Of the criteria pollutants of concern, O_3 is unique because it is not directly emitted from Port-related sources. Rather, ozone is a secondary pollutant, formed from precursor pollutants that include VOC and NO_x. VOC and NO_x react to form O_3 in the presence of sunlight through a complex series of photochemical reactions. As a result, unlike inert pollutants, ozone levels usually peak several hours after the precursors are emitted and many miles downwind of the source. Because of the complexity and uncertainty in predicting photochemical pollutant concentrations, ozone impacts are indirectly addressed by comparing Project-generated emissions of VOC and NO_x to daily emission thresholds set by the SCAQMD. These emission thresholds are discussed in Section 3.2.2.1.

As most of the Project-related emission sources would be diesel-powered, diesel particulate matter (DPM) is a key pollutant evaluated in this analysis. DPM is one of the components of ambient PM_{10} and $PM_{2.5}$. DPM is classified as a TAC by the ARB. As a result, DPM is evaluated in this study both as a criteria pollutant (as a component of PM_{10} and $PM_{2.5}$) and as a TAC (for cancer and non-cancer health effects).

Local Air Monitoring Levels

The EPA designates all areas of the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. A nonattainment designation generally means that a primary NAAQS has been exceeded more than once per year in a given area. The ARB also designates areas of the state as either in attainment or nonattainment of the CAAQS. An area is in nonattainment if a CAAQS has been exceeded more than once in three years. With respect to the NAAQS, the SCAB is presently classified as "severe-17" nonattainment for eight-hour O_3 (the SCAQMD recently requested from EPA a bump-up to "extreme" nonattainment status), "serious" nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, and in attainment for SO_2. The SCAB was historically in nonattainment of the NAAQS for NO_2. The main sources of NO_2 emissions are on-road vehicles (SCAQMD et al. 2006). Due to a reduction in emissions caused by national emission standards for new vehicles and a state vehicle emissions testing program, the region has attained the NO_2 standard since 1991. As a result, in September 1998 the EPA re-designated the SCAB to attainment of the NO_2 NAAQS and the region is now considered a maintenance area for NO_2. Additionally, the EPA reclassified the SCAB as a federal CO attainment region, effective June 11, 2007.

With respect to the CAAQS, the SCAB is presently in "extreme" nonattainment for O_3 and nonattainment for PM_{10}. The air basin is in attainment of the CAAQS for CO, SO_2, NO_2, sulfates, and lead, and is unclassified for hydrogen sulfide, vinyl chloride, and visibility reducing particles.

Generally, concentrations of photochemical smog, or O_3, are highest during the summer months and coincide with the season of maximum solar insolation. Inert pollutant concentrations tend to be the greatest during the winter months and are a product of light wind conditions and surface-based temperature inversions that are frequent during that time of year. These conditions limit atmospheric dispersion. However, in the case of PM_{10} impacts from fugitive dust sources, maximum dust impacts may occur during high wind events and/or in proximity to man-made ground-disturbing activities, such as vehicular activities on roads and earth moving during construction activities.

Air quality within the SCAB has improved since the inception of air pollutant monitoring in 1976 by the SCAQMD (SCAQMD 2006). This improvement is due to the implementation of stationary source emission reduction strategies by the SCAQMD and lower-polluting on-road motor vehicles. This trend towards cleaner air has occurred in spite of continued population growth. While the SCAB exceeded the national one-hour O_3 standard on 208 days in 1977, the number of O_3 exceedance days was 35 in 2006 (ARB 2007a). The SCAB exceeded the national eight-hour O_3 standard on 85 days in 2006 (ARB 2007b).

The SCAQMD maintains a network of air quality monitoring stations throughout the SCAB. The nearest SCAQMD air monitoring station to the Project site is the North Long Beach Monitoring Station (Station No. 072), which is located at 3648 Long Beach Boulevard, approximately four miles north of the Project site. Table 3.2-2 summarizes the maximum pollutant concentrations recorded at the North Long Beach Monitoring Station for 2004 through 2008. The 2007 and 2008 monitoring data became available after completion of the Draft EIS/EIR and they were incorporated in the Final EIS/EIR modeling analyses. Data from this station are used to describe the air quality of the Project region, as it is the closest station and has the longest period of record of measured ambient air quality conditions. The data in Table 3.2-2 show that the following standards were exceeded at the North Long Beach Monitoring Station over the five-year period from 2002 through 2006: (1) O_3 (state one-hour standards); (2) PM_{10} (state 24-hour and annual standards); and (3) $PM_{2.5}$ (national 24-hour standard and national and state annual standards). No standards were exceeded for CO, NO_2, SO_2, lead, and sulfates.

The POLB initiated operation of two monitoring sites in September 2006 to collect ambient air pollutant and meteorological conditions within the Port region (POLB 2007c). The Port's stations are not part of SCAQMD's regional air quality monitoring stations, but rather reflect "localized" concentration measurements in the Port region. The POLB air monitoring stations are located in the Inner Harbor area, near West Long Beach, and in the Outer Harbor area, at the end of Navy Mole Road. The two monitoring stations were developed to expand on and compliment other regional air monitoring efforts. Data from the POLB stations are considered in context with the North Long Beach Monitoring Station for comparison purposes, and to ensure the use of representative ambient data. Table 3.2-3 presents the maximum pollutant levels measured within the POLB monitoring network from October 2006 through January 2008.

Other current and past air monitoring efforts within the Ports' area include: (1) the Port of Los Angeles (POLA), which has operated four ambient air pollutant and meteorological monitoring sites in the POLA area since February 2005 (POLA 2007a); (2) the ARB, which has performed air monitoring on Mahar Avenue in Wilmington from 2001 to 2002 (ARB 2007c) and operates sites in the ports area as part of their Harbor Communities Monitoring Project (ARB 2007c); and (3) the SCAQMD, which operates sites in the ports area as part of their Clean Ports Initiative. Since the POLB monitoring program has only recently collected an annual set of meteorological data, data from the POLA Wilmington and Berth 47 monitoring sites were used as inputs to the Project air quality dispersion modeling analyses, as discussed in Appendix A-2 of this EIS/EIR. These data currently are the most representative of meteorological conditions that occur within the operational areas of Project emission sources.

Ultrafine Particles

Traditionally, health concerns and air quality standards for particulates have been focused on respirable particulate matter (i.e., PM_{10}) and fine particulate matter (i.e., $PM_{2.5}$). However, recently there has been an increased level of interest in the smallest size fraction of particulate matter, referred to as ultrafine particles (UFP). UFP are generally defined as ambient air particles less than or equal to 0.1 micrometers (µm) in diameter (100 nanometers). Due to their small size and cumulative mass, UFP generally contribute a small fraction of the ambient concentrations of either PM_{10} or $PM_{2.5}$ (it takes approximately 15,000 UFP to equal the mass of a single $PM_{2.5}$ particle, and 1,000,000 UFP to equal the mass of a single PM_{10} particle). However, UFP are very numerous, particularly in urban atmospheres. For example, typical urban air contains 10,000 to 40,000 UFP/cm^3, while near highways there can be between 40,000 and 1,000,000 UFP/cm^3. UFP are not routinely measured in the U.S., and there are no regulatory standards that address this category. The 2007 Air Quality Management Plan (AQMP) of the SCAQMD recommends that UFP issues be considered in PM and air toxics control strategies.

In the urban environment, motor vehicles are a major source of UFP, and for that reason they are found in high numbers near highways. Measurements have shown that there is a sharp drop in UFP within 100 to 300 meters downwind of freeways, due to particle growth and accumulation processes in the atmosphere after they have been emitted from vehicles. Consequently, high particle concentrations are very localized and tend to exhibit large geographical and temporal variations. Current research is underway to better characterize emissions and ambient levels of UFP in the environment. Other categories of internal combustion engines used in Port operations, such as trains and ships, may also be significant sources of UFP.

The high numbers of UFP found in the environment, especially in areas such as highways, have recently raised concerns about their health effects. There are two primary reasons for these concerns: (1) studies have shown that smaller particles, which tend to absorb higher fractions of trace metals and organic compounds because of their relatively high surface area, can be inhaled and deposited deeper into the lungs than larger particles; and (2) UFP can be more easily transported from the lungs into the body, potentially increasing exposure to these particles and contaminants adsorbed on the particles. Information on UFP is limited at this time and is an area of active research.

Toxic Air Contaminants

The ARB regulates a list of TACs in California, as determined from their exposure assessments and health effects assessments performed by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). TACs are compounds that are known or suspected to cause adverse long-term (cancer and chronic) and/or short-term (acute) health effects. In addition to DPM, exposure to elevated PM concentrations also may cause a reduction in life span or premature death. The OEHHA develops guidelines to evaluate cancer and non-cancer effects from TAC exposure for a HRA and the Toxic "Hot Spots" Program (AB 2588), based on information available from published animal and human studies.

TACs are emitted from industrial processes and stationary sources, such as dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel-burning combustion. The SCAQMD estimates in the *Multiple Air Toxics Exposure Study II* (MATES-II) that about 70 percent of the background airborne cancer risk in the SCAB is due to PM emissions from diesel-powered on- and off-road motor vehicles (SCAQMD 2000). Due to the prevalence of diesel-powered sources associated with operations at the San Pedro Bay ports, MATES-II identified that the ports area has some of the highest ambient airborne cancer risks within the SCAB.

The SCAQMD began a subsequent air toxics study, MATES-III, in 2004 as part of the *Environmental Justice Workplan 2003-4 Summary* (SCAQMD 2004). The MATES III study consisted of three elements: (1) a monitoring program; (2) an updated emissions inventory of toxic air contaminants; and (3) a modeling effort to characterize risk across the Basin. The study focused on the carcinogenic risk from exposure to air toxics. The draft report on the MATES-III study was released for public review in January 2008. The draft study concludes that the population-weighted risk in the Basin dropped by 17 percent, but diesel particulates continue to dominate the risk from air toxics, accounting for 84 percent of the carcinogenic risk. The highest modeled risks were found near the ports area, an area near central Los Angeles, and near transportation corridors. Based on this report, which is still in draft and subject to change, the monitoring data indicate that risks were similar throughout the Basin, and that there will be continued focus on reducing toxic emissions, particularly from diesel engines to reduce air toxics exposures.

The ARB also funds a variety of health effects studies within the Port region through their air toxics and environmental health programs (ARB 2006b). The ARB estimates that operational emissions from the ports also produce elevated levels of cancer risk within and in proximity to the two ports (ARB 2006a).

The POLB, in conjunction with the POLA and with guidance from the SCAQMD, ARB, and EPA, has developed the San Pedro Bay Ports Clean Air Action Plan (CAAP), which is designed to substantially reduce DPM emissions and health risks from the operations of port-related ships, trains, trucks, terminal equipment and harbor craft (POLB and POLA 2006). The CAAP proposes to cut DPM emissions from port-related sources by at least 47 percent within the next five years.

Secondary $PM_{2.5}$ Formation

Primary particles are emitted directly into the atmosphere by fossil fuel combustion sources, windblown soil and dust, and sea spray. Secondary $PM_{2.5}$ forms in the atmosphere by complex reactions of precursor emissions of gaseous pollutants, such as NO_x, SO_x, VOCs, and ammonia (SCAQMD et al. 2006). Secondary $PM_{2.5}$ includes sulfates, nitrates, and complex carbon compounds.

Project-generated emissions of NO_x, SO_x, and VOCs would contribute to secondary $PM_{2.5}$ formation some distance downwind of the emission sources. However, since it is hard to predict secondary $PM_{2.5}$ formation from an individual project, the air quality analysis in this EIS/EIR focuses on the effects of direct $PM_{2.5}$ emissions generated by the proposed Project. This approach is consistent with the recommendations of the SCAQMD (SCAQMD 2006b).

Atmospheric Deposition

The fallout of air pollutants to the surface of the earth is known as atmospheric deposition. Atmospheric deposition occurs in both a wet and dry form. Wet deposition occurs in the form of precipitation or cloud water and is associated with the conversion in the atmosphere of directly emitted pollutants into secondary pollutants such as acids. Dry deposition occurs in the form of directly emitted pollutants or the conversion of gaseous pollutants into secondary PM. Atmospheric deposition can produce watershed acidification, aquatic toxic pollutant loading, deforestation, damage to building materials, and respiratory problems.

The ARB and California Water Resources Control Board are in the process of examining the need to regulate atmospheric deposition for the purpose of protecting both fresh and salt water bodies from pollution. Port emissions deposit into both local waterways and regional land areas. Emission sources from the Project would produce DPM, which contains trace amounts of toxic chemicals. Implementation of the CAAP will reduce air pollutants from future Port operations, which will help achieve the goal of reducing atmospheric deposition for purposes of water quality protection. The CAAP (and future Project conditions) will reduce air pollutants that generate both acidic and toxic compounds, including emissions of NO_x, SO_x, and DPM.

Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are known as GHG. GHG are emitted by natural processes and human activities. Examples of GHG that are produced both by natural processes and industry include CO_2, methane (CH_4), and nitrous oxide (N_2O). The accumulation of GHG in the atmosphere regulates the earth's temperature. Without these natural GHG, the Earth's surface would be about 61°F cooler (AEP 2007). However, emissions from fossil fuel combustion by humans have elevated the concentration of GHG in the atmosphere to above natural levels. Scientific evidence indicates a correlation between increasing global temperatures/climate change over the past century and human induced levels of GHG. These and other environmental changes have potentially negative environmental, economic, and social consequences around the globe.

According to the Intergovernmental Panel on Climate Change (IPCC) (IPCC 2007), the atmospheric concentration of CO_2 in 2005 was 379 ppm. This compares to pre-industrial levels of 280 ppm. The Fourth U.S. Climate Action Report concluded, in assessing current trends, that CO_2 emissions increased by 20 percent from 1990 to 2004, while methane and nitrous oxide emissions decreased by 10 percent and two percent, respectively. Additional information regarding climate change can be found at the following resources:

1. ARB's climate change program website, which provides information regarding the implementation of California's Climate Change Scoping Plan to mitigate and reduce greenhouse gas emissions in California: http://www.arb.ca.gov/cc/cc.htm;

2. EPA's Climate Change website, which offers comprehensive information on the issue of climate change and US policies on this subject: http://www.epa.gov/climatechange/; and

3. United Nations Environmental Program (UNEP) Climate Change website for a global prospective: http://www.unep.org/themes/climatechange/.

GHG differ from criteria or toxic air pollutants in that GHG emissions do not cause direct adverse human health effects. Rather, the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans.

For example, some observed changes include shrinking glaciers, thawing permafrost, later freezing and earlier break-up of ice on rivers and lakes, a lengthened growing season, shifts in plant and animal ranges, and earlier flowering of trees (IPCC 2001). Other, longer term environmental impacts of global warming may include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack (for example, estimates include a 30-90 percent reduction in snowpack in the Sierra Mountains).

Current data suggest that in the next 25 years, in every season of the year, California will experience unprecedented heat, longer and more extreme heat waves, greater intensity and frequency of heat waves, and longer dry periods. More specifically, the California Climate Change Center (2006) predicted that California could witness the following events:

- Temperature rises between three to 10.5°F;
- Six to 20 inches or more rise in sea level;
- Two to four times as many heat wave days in major urban centers;
- Two to six times as many heat related deaths in major urban centers;
- One to 1.5 times more critically dry years; and
- 10 to 55 percent increase in the expected risk of wildfires.

The California Natural Resources Agency is presently developing the State's Climate Adaptation Strategy.

Currently, there are no federal standards for GHG emissions and federal regulations have not been promulgated. Recently, the U.S. Supreme Court ruled that the harms associated with climate change are serious and well recognized, that the EPA must regulate GHG as pollutants, and unless the agency determines that GHG do not contribute to climate change, it must promulgate regulations for GHG emissions from new motor vehicles (*Massachusetts et al. Environmental Protection Agency* [case No. 05-1120]).

To date, 12 states, including California, have set State GHG emission targets. EO S-3-05 and the passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, promulgated the California target to achieve reductions in GHG to 1990 GHG emission levels by the year 2020. The target-setting approach allows progress to be made in addressing climate change, and is a forerunner to setting emission limits. A companion bill, Senate Bill (SB) 1368, similarly addresses global warming, but from the perspective of electricity generators selling power into the state. The legislation requires that imported power meet the same GHG standards that power plants in California meet. SB 1368 also sets standards for CO_2 for any long term power production of electricity at 1,000 pounds per megawatt hour.

The GHG Protocol Initiative of the World Resources Institute (WRI) identifies six GHG generated by human activity that are believed to be contributors to global warming (WRI and WBCSD 2007). These same GHG are identified in AB 32 and by the EPA: (1) CO_2; (2) CH_4; (3) N_2O; (4) hydrofluorocarbons (HFCs); (5) Perfluorocarbons (PFC); and (6) sulfur hexafluoride (SF_6).

GHG have varying amounts of global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO_2 is assigned a GWP of one. In comparison, CH_4 has a GWP of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. To account for their GWP, GHG emissions are often reported as a CO_2e. The CO_2e for a source is calculated by multiplying each GHG emission by its GWP, and adding the results together to produce a single, combined emission rate representing all GHG.

Black carbon has recently been implicated as a contributor to global warming, because it absorbs heat while airborne in the atmosphere (House of Representatives 2007). It also may contribute to melting of snowpack, glaciers, and polar ice when it settles on these surfaces, as its black color absorbs more solar radiation than ice. Recent research indicates that some fraction of black carbon observed in California mountains is likely due to trans-Pacific transport from Asia (Hadley, O et. al. 2008). Black carbon is emitted from a range of naturally occurring events and human activities, including wildfires, diesel engines, and domestic biofuel burning. Emission studies suggest that approximately one-third of black carbon emissions come from biomass burning sources such as waste combustion and wood-fired stoves, and the remainder come from fossil fuel burning sources such as diesel engines (House of Representatives 2007). At present, there are no standards, regulations, or protocols related to assessing or mitigating black carbon emissions.

Black carbon is a component of DPM, and therefore is released into the atmosphere as a component of diesel engines emissions. Black carbon emissions are addressed in this Final EIS/EIR through the detailed analysis of DPM emissions. DPM emissions are the focus of the Project criteria pollutant and HRA. The health risk factors for DPM take into consideration all of its chemical constituents, including black carbon. Therefore, black carbon emissions are addressed as part of DPM through the Project HRA.

The Project air quality analysis includes estimates of GHG emissions generated by the existing Middle Harbor container terminals and future conditions. Appendix A-1 documents the Project GHG emission calculations.

Sensitive Receptors

The impact of air emissions on sensitive members of the population is a special concern. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. According to SCAQMD guidance, sensitive receptor locations include schools, hospitals, convalescent homes, day-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be exposed.

The nearest sensitive receptors to the proposed Project include residents in southwest Long Beach. Cesar Chavez Elementary, the nearest elementary school, is 0.28 miles from the Project site; the nearest convalescent home, the Breakers of Long Beach, is about one mile east; and the nearest hospital is the Saint Mary Medical Center, about 1.3 miles northeast of the Project site. Residents, grammar schools, and daycare facilities in southeast Wilmington also are in proximity to the Project site. Table A-3-3 in Appendix A-3 provides a complete listing of the sensitive receptors that occur in proximity to the Project site that were evaluated for the Project air quality analyses.

3.2.1.3 Regulatory Setting

Sources of air emissions in the SCAB are regulated by the EPA, ARB, and SCAQMD. In addition, regional and local jurisdictions play a role in air quality management. The role of each regulatory agency is discussed below.

Federal Regulations

The federal Clean Air Act (CAA) of 1969 and its subsequent amendments form the basis for the nation’s air pollution control effort. The EPA is responsible for implementing most aspects of the CAA. Basic elements of the act include the NAAQS for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The CAA delegates the enforcement of the federal standards to the states. In California, the ARB is responsible for enforcing air pollution regulations. In the SCAB, the SCAQMD has this responsibility.

State Implementation Plan

For areas that do not attain the NAAQS, the CAA requires the preparation of a SIP, detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, the SCAQMD and SCAG developed the *2003 AQMP* (SCAG 2004). The focus of the *2003 AQMP* was to demonstrate attainment of the federal PM_{10} standard by 2006 and the federal one-hour ozone standard by 2010, while making expeditious progress toward attainment of state standards.

The SCAQMD and SCAG, in cooperation with the ARB and EPA, have developed the *2007 AQMP* for purposes of demonstrating compliance with the new NAAQS for $PM_{2.5}$, the NAAQS for PM_{10}, the eight-hour O_3 NAAQS, one-hour O_3 NAAQS (the standard was revoked by the EPA, but the SCAQMD is still tracking progress towards attainment of this standard), and other planning requirements (SCAQMD et al. 2006). The SCAQMD Governing Board adopted the *Final 2007 AQMP* on June 1, 2007 (SCAQMD 2007a). Since it will be more difficult to achieve the eight-hour O_3 NAAQS compared to the one-hour NAAQS, the *2007 AQMP* contains substantially more emission reduction measures compared to the *2003 AQMP*. The 2007 AQMP is still under review and has not been approved by EPA.

The EPA recently re-designated the SCAB from nonattainment to attainment for the CO one-hour and eight-hour NAAQS. The EPA also approved a SIP revision for the SCAB nonattainment area in California as meeting the CAA requirements for maintenance plans for CO. The EPA made an adequacy finding and approved motor vehicle emission budgets, which are included in the maintenance plan. The EPA also approved the California motor vehicle inspection and maintenance (I/M) program as meeting the low enhanced I/M requirements for CO in the South Coast region (EPA 2007c).

IMO MARPOL Annex VI

The International Maritime Organization (IMO) adopted NO_x limits in MARPOL Annex VI to the International Convention for the Prevention of Pollution from Ships in 1997. These NO_x limits apply to Category 3 (less than 30 liters per cylinder displacement) marine engines installed on vessels built on or after 2000. The NO_x standards are from 17.0 grams per kilowatt hour (g/kW-hr) (for less than 130 revolutions per minute [rpm]) to 9.8 g/kW-hr (for less than 2000 rpm), depending on the engine speed in rpm. The required number of countries ratified the Annex in May 2004 and it went into force for those countries in May 2005. The Annex has not yet been ratified by the U.S. Engine manufacturers have been certifying engines to the Annex VI NO_x limits since 2000 as the standards are retroactive. For OGV main propulsion engines (less than 130 rpm engine speed), the limits are about six percent lower than the average emissions from pre-Annex VI ships used in the *POLB 2005 Air Emissions Inventory* (Starcrest Consulting Group 2007).

In October 2008, the Marine Environment Protection Committee (MEPC) of the IMO unanimously adopted amendments to the MARPOL Annex VI regulations that would reduce fuel sulfur content and NO_x emissions from OGV. These requirements include: (1) global standards; and (2) tighter standards for ships that operate in areas with air quality problems, designated as Emission Control Areas (ECAs). The global sulfur cap will initially be reduced to 3.5 percent (from the current 4.5 percent), effective on January 1, 2012, then progressively decrease to 0.5 percent, effective from January 1, 2020, subject to a feasibility review to be completed no later than 2018. The limits applicable in ECAs would be reduced to one percent, beginning on July 1, 2010 (from the current 1.5 percent), and further reduced to 0.1 percent, effective from January 1, 2015.

The NO_x engine standards include the following:

1. The ECA engine emission standards are Tier 3 for new engines and equate to 80 percent NO_x reduction starting January 2016 (based on the use of advanced catalytic after treatment systems). EPA is in the process of preparing an application for ECA status for U.S. coastal waters. The Port is working with the EPA to develop a West Coast ECA and they fully support the establishment of the West Coast as an ECA.
2. The global engine emission standards are (1) Tier 2 for new engines (20 percent NO_x reduction starting January 2011) and (2) Tier 1 for existing engines, or equal to those adopted by EPA in 2003 and the current IMO Annex VI standards (15-20 percent NO_x reduction from current uncontrolled levels).

Manufacturers may begin certifying systems (sets of upgraded replacement parts) starting in 2010. Installation will occur at a vessel's first "renewal survey" following the Tier 1 certification applicable to the vessel's engines. A renewal survey is a major inspection and maintenance activity, typically done every five years.

<u>Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder</u>

In February 2003, the EPA adopted Tier 1 standards for Category 3 OGV engines that are equivalent to the IMO MARPOL Annex VI requirements. The 2003 rule established a deadline of April 27, 2007 for EPA to promulgate a new tier of emission standards for new compression-ignition Category 3 marine engines, as determined appropriate under CAA Section 213(a). To allow sufficient time for data gathering on control technologies, while working cooperatively with IMO on setting these next tier of emission standards for OGV, the EPA published a Final Rule extending the deadline for developing the new tier emission standards to December 17, 2009 (EPA 2007d).

<u>Emission Standards for Marine Diesel Engines</u>

To reduce emissions from Category 1 (at least 50 horsepower [hp] but less than five liters per cylinder displacement) and Category 2 (five to 30 liters per cylinder displacement) marine diesel engines, the EPA has established emission standards for new engines, referred to as Tier 2 marine engine standards. The Tier 2 standards are being phased in from 2004 to 2007 (year of manufacture), depending on the engine size (EPA 1999). The Project air quality analysis assumes that this rule would affect the Port harbor craft but not OGV auxiliary engines, as the latter are generally manufactured overseas and therefore, would be exempt from the rule.

On March 14, 2008, the EPA adopted Tiers 3 and 4 emissions standards for newly manufactured and remanufactured commercial marine diesel engines above 600 kilowatts (kW) or 800 hp with displacement less than 30 liters per cylinder installed on vessels flagged or registered in the U.S. (EPA 2008b). These standards would substantially reduce emissions from these sources, compared to the current Tier 2 standards.

<u>Emission Standards for Non-Road Diesel Engines</u>

The EPA has established a series of cleaner emission standards for new off-road diesel engines culminating in the Tier 4 Final Rule of June 2004. The Tier 1, Tier 2, Tier 3, and Tier 4 standards require compliance with progressively more stringent emission standards. Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006 and the Tier 3 standards are being phased in from 2006 to 2008. The Tier 4 standards complement the latest 2007 on-road heavy-duty engine standards by requiring 90 percent reduction in DPM and NO_x when compared against current emission levels. To meet these standards, engine manufacturers will produce new engines with advanced emissions control technologies similar to those already expected for on-road heavy duty diesel vehicles. The Tier 4 standards will be phased in starting with smaller engines in 2008 until all but the very largest diesel engines meet NO_x and PM standards in 2015. These standards apply to construction and terminal equipment, but not locomotives or marine vessels.

Emission Standards for Locomotives

In 1998, the EPA adopted Tier 0 (1973-2001), Tier 1 (2002-2004), and Tier 2 (2005+) emission standards applicable to newly manufactured and remanufactured railroad locomotives and locomotive engines. These standards require compliance with progressively more stringent standards for emissions of VOC, CO, NO_x, and DPM. Although the most stringent standard, Tier 2, results in over 40 and 60 percent reductions in NO_x and DPM compared to Tier 0, the infiltration of Tier 2 engines into the national fleet will occur slowly because of the long life of diesel locomotive engines.

On March 14, 2008, the EPA adopted Tiers 3 and 4 emissions standards for all diesel line-haul, passenger, and switch locomotives that operate extensively within the U.S., including newly manufactured locomotives and remanufactured locomotives that were originally manufactured after 1972 (EPA 2008b). These standards would substantially reduce emissions from these sources, compared to the current Tier 2 standards.

The finalized rule sets Tier 3 emission standards for new engines starting in 2008, and for existing locomotives and large marine diesel engines when they are remanufactured, starting in 2009. It sets Tier 4 standards, for newly-built locomotives and marine diesel engines that reflect the application of high-efficiency after treatment technology, with a phase in starting in 2015. EPA also finalized new idle reduction requirements for newly-built and remanufactured locomotives.

Non-Road Diesel Fuel Rule

In May 2004, the EPA set sulfur limits for non-road diesel fuel, including locomotives and marine vessels (excluding residual fuel used by OGV). Under this rule, diesel fuel used by line-haul locomotives would be limited to 500 ppm starting June 1, 2007 and 15 ppm starting January 1, 2012 (EPA 2004). The California Diesel Fuel Regulations (described below) generally is more stringent than this rule for other Project sources, such as switch yard locomotives, construction equipment, terminal equipment, and harbor craft.

Emission Standards for On-Road Trucks

To reduce emissions from on-road, heavy-duty diesel trucks, EPA established a series of cleaner emission standards for new engines, starting in 1988. The 2007 Heavy-Duty Highway Rule provides the final and cleanest Tier 4 standards for engines manufactured in 2007 (EPA 2000a). Complete phase-in of the 2007 standards for new engines will be accomplished by 2010.

Highway Diesel Fuel Rule

With this rule, the EPA set sulfur limitations for on-road diesel fuel to 15 ppm starting June 1, 2006 (EPA 2000a and 2007f). Beginning with the 2007 model year, sulfur emissions from heavy-duty highway vehicles (trucks and buses) will be reduced by more than 90 percent.

General Conformity Rule

Section 176(c) of the CAA states that a federal agency cannot issue a permit for or support an activity within a nonattainment or maintenance area unless the agency determines it will conform to the most recent EPA-approved SIP. This means that projects using federal funds or requiring federal approval must not: (1) cause or contribute to any new violation of a NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone.

Based on the present attainment status of the SCAB, a federal action would conform to the SIP if its annual emissions remain below 100 tons of CO or $PM_{2.5}$, 70 tons of PM_{10}, or 25 tons of NO_x or VOCs. The U.S. Court of Appeals ruled in December 2006 that areas in nonattainment of the one-hour O_3 NAAQS that were superseded by the eight-hour nonattainment classifications must also consider the one-hour requirements in conformity analyses (*South Coast Air Quality Management District v. EPA*, *et al.*, 472 F.3d 882) (U.S. Court of Appeals, District of Columbia Circuit 2006). Hence, to conform to the SIP in the SCAB, a federal action also would have to comply with annual *de minimis* thresholds of 10 tons per year of NO_x or VOCs, as the SCAB was in extreme nonattainment of the one-hour O_3 NAAQS. These *de minimis* thresholds apply to both proposed construction and operational activities. For proposed Project operations, the thresholds are compared to the net change in emissions relative to the NEPA Baseline. If the proposed Project exceeds one or more of the *de minimis* thresholds, a conformity determination is the next step in the conformity evaluation process. SCAQMD Rule 1901 adopts the guidelines of the General Conformity Rule.

Conformity Statement

As part of the environmental review of the federal actions for the proposed Project and alternatives, the USACE conducted a general conformity evaluation pursuant to 40 C.F.R. Part 93 Subpart B. The general conformity regulations apply at this time to any actions at POLB requiring USACE approval because the SCAB where the POLB is situated is a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$, and a maintenance area for NO_2 and CO. The USACE conducted the general conformity evaluation following all regulatory criteria and procedures and in coordination with EPA and SCAG.

The alternatives to the Project include: the 315-Acre Alternative (Alternative 2); the Landside Improvements Alternative (Alternative 3), which is the same as the NEPA Baseline; and the No Project Alternative (Alternative 4). Alternatives 3 and 4 would have no in-water or over-water activities, and therefore would require no federal permit from the USACE; nor would either alternative have any other federal involvement. Thus, the General Conformity Regulation does not apply to Alternatives 3 and 4.

Table 3.2-4 summarizes the annual conformity-related emissions for the federal action construction-related activities of the Alternative 1. These data show that Alternative 1 would exceed the NO_x annual *de minimis* threshold during construction years 2010 through 2015, 2017, and 2018. It would not exceed the NO_x annual *de minimis* threshold in 2009, 2015, and 2019. Also shown in Table 3.2-4 are the annual conformity-related emissions for the federal action construction-related activities of Alternative 2. These data show that Alternative 2 would exceed the NO_x annual *de minimis* threshold during construction years 2010 through 2014. It would not exceed the NO_x annual *de minimis* threshold in 2009 and 2015. As a result, a General Conformity Determination is required for the Alternative 1 and Alternative 2. Appendix A-4 presents the draft Conformity Analysis and Determination for this Project.

The POLB regularly provides its Port-wide cargo forecasts to SCAG, who incorporates it in their Regional Transportation Plan (RTP), which is then provided to the SCAQMD for the development of their AQMPs (including the latest 2007 AQMP [SCAG 2009]). Cargo projections have been included in all SCAB attainment and maintenance plans, including the most recent EPA-approved 1997/1999 SIP. As a result, the proposed Project would conform to the most recently EPA-approved SIP.

The analysis in Appendix A-4 shows that emissions from the Project (Table A-4-3) and Alternative 2 (Table A-4-7) would not be regionally significant, as they would be less than 10 percent of those emissions associated with the SCAB planning area.

Tables A-4-4 and A-4-5 in Appendix A-4 present emissions from the federal action portion of the proposed Project in terms of the individual construction source categories and compares them to the projected emissions for these same categories, in the 1997/1999 SIP, and to emissions budgets extracted from the 2007 AQMP. ARB staff extracted emissions data for trucks and tugboats in each of these source categories from ARB's California Emission Forecasting System. Direct comparisons between the federal action's emissions and the 2007 SIP emissions were available during the construction period for four of the 2007 AQMP targeted years: 2010 (the projected peak year of construction emissions), 2011, 2014, and 2015.

The tables show that the NO_x emissions from construction activities resulting from the federal action are small relative to the SIP emission budgets in the SCAB. For the 1997/1999 SIP, construction emissions are a maximum of 0.3 percent or less of the budget for the corresponding source categories. For the 2007 SIP; construction emissions would equal a maximum of 4.2 percent of the budget of certain specialized source categories available from the 2007 AQMP. Specifically, tugboats working on construction activities between zero to three nm and three to 100 nm of the shore would emit between 0.5 and 4.2 percent of the SIP budgets for those two categories (tugboats within zero to three nm of the shore and within three to 100 nm of the shore). Even this small consumption of these emission categories reflects the focused nature of these source categories; the other construction source categories (construction equipment and trucks) would not exceed 0.1 percent of their respective categories.

For that reason, it is reasonable to assume that the emissions from construction activities that would result from the federal action can be accommodated in future emissions growth from the construction sector within the approved 1997/1999 SIP or alternatively within the 2007 AQMP. Therefore, it can be inferred that the construction NO_x emissions for the federal action, taken together with NO_x emissions from all other construction sources in the SCAB, would not exceed the NO_x emission budgets for construction-related source types specified in the approved SIP or the 2007 AQMP. As a result, the federal action associated with the proposed Project would conform to the most recent federally approved SCAB SIP.

As discussed in Appendix A-4, the results for the federal action portion of Alternative 2 were similar.

The USACE proposes that the federal actions for Alternatives 1 and 2, as designed, will conform to the approved SIP for NO_x (as an O_3 precursor) and for NO_x (as a $PM_{2.5}$ precursor) because the net emissions associated with the federal actions, taken together with all other NO_x emissions in the SCAB, would not exceed the emissions budgets in the approved SIP for the years subject to the general conformity evaluation.

Therefore, the USACE concludes that the federal actions associated with the proposed Project and Alternative 2 as designed would conform to the purpose of the approved SIP and they are consistent with all applicable requirements.

State Regulations and Agreements

California Clean Air Act

In California, the ARB is designated as the responsible agency for all air quality regulations. The ARB, which became part of the California Environmental Protection Agency (Cal-EPA) in 1991, is responsible for implementing the requirements of the federal CAA, regulating emissions from motor vehicles and consumer products, and implementing the California Clean Air Act of 1988 (CCAA). The CCAA outlines a program to attain the CAAQS for O_3, NO_2, SO_2, and CO by the earliest practical date. Since the CAAQS are more stringent than the NAAQS, attainment of the CAAQS will require more emission reductions than what will be required to show attainment of the NAAQS. Similar to the federal system, the state requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

AB 2650

AB 2650 (Lowenthal) became effective on January 1, 2003. Under AB 2650, shipping terminal operators are required to limit truck-waiting times to no more than 30 minutes at the Ports of Long Beach, Los Angeles, and Oakland, or face fines of $250 per violation. Collected fines will be used to provide grants to truck drivers to replace and retrofit their vehicles with cleaner engines and pollution control devices. A companion piece of legislation (AB 1971) was passed in September 2004 that would ensure that the intent of AB 2650 is not circumvented by allowing trucks with appointments to wait inside terminal gates.

Heavy Duty Diesel Truck Idling Regulation

This ARB rule became effective in February 1, 2005 and prohibits heavy-duty diesel trucks from idling for longer than five minutes at a time, unless they are queuing, and provided the queue is located beyond 100 feet from any homes or schools (ARB 2006c).

1998 South Coast Locomotive Emissions Agreement

In order to accelerate the implementation of Tier 2 locomotive engines in the SCAB, the ARB and EPA entered into an enforceable Memorandum of Understanding (MOU) in 1998 with two major Class 1 freight railroads in California, UP and BNSF. This MOU requires UP and BNSF to accelerate the introduction of the Tier 2 standard locomotives into the SCAB fleet and to achieve average emissions equivalent to the Tier 2 NO_x standard (5.5 grams per brake horsepower-hour) by 2010. This program will achieve a 65 percent reduction in NO_x emissions by 2010. The MOU applies to both line-haul (freight) and switch locomotives operated by the railroads (ARB 2005).

2005 ARB/Railroad Statewide Agreement

In 2005, the ARB entered into another MOU with UP and BNSF whereby these two railroads would mitigate DPM emissions from railyard operations for the purpose of reducing pollutant impacts to local communities. The MOU proposes to: (1) phase out non-essential idling and install idling reduction devices; (2) identify and expeditiously repair locomotives that smoke excessively, and (3) maximize the use of 15 ppm sulfur diesel fuel (ARB 2005).

California Diesel Fuel Regulations

In 2004, the ARB set limits on the sulfur content of diesel fuel sold in California for use in on-road and off-road motor vehicles (ARB 2004). Harbor craft and intrastate locomotives were originally excluded from the rule, but were later included by a 2004 rule amendment (ARB 2005b). Under this rule, diesel fuel used in motor vehicles, except harbor craft and intrastate locomotives, has been limited to 500-ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm beginning on September 1, 2006. (The federal diesel rule similarly limited sulfur content nationwide for on-road vehicles to 15 ppm on October 15, 2006.) Diesel fuel used in harbor craft in the SCAB also was limited to 500-

ppm sulfur starting January 1, 2006 and was lowered to 15-ppm sulfur in September 1, 2006. Diesel fuel used in intrastate locomotives (switch locomotives) was limited to 15-ppm sulfur starting on January 1, 2007.

<u>Measures to Reduce Emissions from Goods Movement Activities</u>

In April 2006, the ARB approved the *Emission Reduction Plan for Ports and Goods Movement in California* (ARB 2006d). The Goods Movement Plan proposes measures that would reduce emissions from the main sources associated with port cargo handling activities, including ships, harbor craft, terminal equipment, trucks, and locomotives. This Plan currently is under public review.

The ARB approved the Ship Auxiliary Engine Regulation in 2005, and enforcement of the requirements began on January 1, 2007. This regulation required the use of diesel fuel with a sulfur content of equal or less than 0.5/0.1 percent by 2007/2010 in marine auxiliary engines within 24 nm of the California coastline. However, ARB is no longer enforcing this regulation pursuant to an injunction issued by a federal district court. The court order may be dissolved if the ARB receives an authorization from EPA to enforce the regulation.

The ARB approved an updated version of the Ship Auxiliary Engine Regulation on July 24, 2008. This Fuel Sulfur Regulation for OGV (auxiliary, main engines, and boilers) is designed to not require an authorization from the EPA. The fuel requirements in the proposed regulation would apply to ocean-going vessel main (propulsion) diesel engines, auxiliary diesel engines, and auxiliary boilers when OGV are traveling operating within 24 nm of the California Coastline. Vessel owners/operators would be required to use the marine distillate fuels based on a phased approach. The “Phase I” fuel requirement specifies the use of marine gas oil (DMA) up to 1.5 percent sulfur, or marine diesel oil (DMB) up to 0.5 percent sulfur. The Phase I fuel requirement would become effective on July 1, 2009 for main engines and auxiliary boilers under the proposed compliance schedule. For auxiliary engines (including diesel-electrics), the fuel requirements would become effective when the regulation becomes law. Under Phase II, which will become effective on January 1, 2012, vessels must use DMA or DMB at or below 0.1 percent sulfur. The ARB expects the regulation to become effective in early 2009.

On December 6, 2007, the Office of Administrative Law (OAL) for the State of California approved regulations to reduce emissions from diesel auxiliary engines on container ships, passenger ships, and refrigerated cargo ships while at-berth at California ports. This At-Berth OGV Regulation for Auxiliary Engines requires 10 percent reduction of at-berth emissions (through a number of options) by 2010, 25 percent reduction by 2012, 50 percent reduction by 2014, 70 percent reduction by 2017, and 80 percent reduction by 2020. It allows reductions achieved earlier, or in excess of the 2010 requirement, to be applied to meeting the 2010, 2012, or 2017 emission reduction requirements and, similarly, allow reductions achieved in excess of the 2012 requirements to be used to meet the 2017 requirement, according to a specified procedure. The regulation became effective on January 2, 2009. Any ocean-going vessel equipped to receive shore power that visits a terminal with a berth equipped to provide compatible shore power shall utilize the shore power during every visit to that berth, unless the berth is already occupied with a vessel receiving shore power.

In December of 2005 the ARB adopted the Regulation for mobile cargo handling equipment (CHE) at Ports and Intermodal Railyards, which requires the use of best available control technology (BACT) to reduce DPM and NO_x emissions from mobile cargo-handling equipment at ports and intermodal railyards (ARB 2005c). Beginning January 1, 2007 the regulation requires that newly purchased, leased, or rented CHE be equipped with either a 2007 or newer on-road engine, a Tier 4 off-road engine, or the cleanest verified emissions control system which reduces DPM by 90 percent and NO_x by at least 70 percent for yard tractors. For non-yard tractors cargo handling equipment, the requirements include currently verified technologies that reduce DPM by 85 percent.

On December 7, 2007, the ARB approved proposed regulations to reduce emissions from heavy-duty drayage trucks (trucks committed to container cargo transport) at ports and intermodal railyards. This regulation includes an accelerated phase-out of existing vehicles to trucks that meet 2007 emission standards by 2014 (ARB 2007b).

<u>Statewide Portable Equipment Registration Program (PERP)</u>

The PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units (ARB 2005d). Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts, as long as the equipment is located at a single location for no more than 12 months. The PERP generally would apply to portable barge equipment used during proposed construction activities.

<u>AB 32 - California Global Warming Solutions Act of 2006</u>

AB 32 was signed into law by Governor Schwarzenegger on September 27, 2006 and is the first law to comprehensively limit GHG emissions at the state level. The intent of the Act is to reduce California GHG emissions to 1990 levels by 2020. The Act instructs the ARB to adopt regulations that will reduce emissions from significant sources of GHG and establish a mandatory GHG reporting and verification program by January 1, 2008. On December 6, 2007, the ARB approved a regulation for the mandatory reporting of greenhouse gas emissions from major sources. The revised version of the mandatory reporting regulation will be made available in early April 2008 (ARB 2008). AB 32 requires the ARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which are to become effective on January 1, 2012. The ARB approved a 2020 emissions limit of 427 million metric tons of CO_2e in December 2007. The 2020 emissions limit is equivalent to actual 1990 emission levels.

In December 2007, the ARB adopted Shore Power (Green Ports) and the drayage truck regulation as early action GHG reduction measures which will significantly reduce NO_x, DPM, and GHG (CO_2) emissions. Three additional control measures which are under consideration by the ARB include: (1) OGV speed reduction; (2) anti-idling restrictions on CHE; and (3) cold storage prohibitions for transport refrigeration units (TRUs) (ARB 2008).

In October 2008, the ARB approved the Climate Change Proposed Scoping Plan (Scoping Plan) which outlines the State's strategy for achieving the 2020 GHG emissions limit outlined under the law. The Scoping Plan includes recommendations for reducing GHG emissions from most sectors of the California economy. For goods movement, the Scoping Plan included two measures. The first, Measure T-5, was an Early Action Measure requiring Ship Electrification at Ports (i.e., shore-to-ship power or "cold-ironing"). The second, Measure T-6, calls for reducing GHG emissions from goods movement through various "efficiency" measures. While Measure T-6 includes several explicit strategies, including the State's Port Drayage Truck rule and the OGV Vessel Speed Reduction rule, many of the specific voluntary or regulatory strategies needed to achieve the Scoping Plan's GHG emission reduction target for goods movement have yet to be defined.

AB 32 does not identify a significance level of GHG for NEPA/CEQA purposes. Pursuant to Senate Bill 97 (Chapter 185, 2007) the Governor's Office of Planning and Research (OPR) is in the process of developing CEQA guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions. OPR is required to submit the guidelines to the Resources Agency on or before July 1, 2009. The Resources Agency must certify and adopt the guidelines on or before January 1, 2010.

<u>California Climate Action Registry (CCAR)</u>

Established by the California Legislature in 2000, the California Climate Action Registry is a non-profit public-private partnership that maintains a voluntary registry for GHG emissions. The purpose of CCAR is to help companies, organizations, and local agencies establish GHG emissions baselines for purposes of complying with future GHG emission reduction requirements.

AB 32 requires the ARB to incorporate the standards and protocols developed by CCAR into the state's future GHG emissions reporting program, to the maximum extent feasible. The current GHG emission calculation methods used by CCAR are contained in *California Climate Action Registry – General Reporting Protocol,* Version 2.2 (CCAR Protocol) (CCAR 2007). This protocol categorizes GHG emission sources as either: (1) direct (vehicles, onsite combustion, fugitive, and process emissions); or (2) indirect (from offsite electricity, steam, and co-generation). The City of Long Beach (and the Port, as the City Harbor Department) is a member of the CCAR.

Local Regulations and Agreements

Through the attainment planning process, the SCAQMD develops the *SCAQMD Rules and Regulations* to regulate sources of air pollution in the SCAB (SCAQMD 2007). The most pertinent SCAQMD rules to the proposed Project are listed below. With the possible exception of barge equipment used during construction, the emission sources associated with the proposed Project are considered mobile sources. Therefore, they are not subject to the SCAQMD rules that apply to stationary sources, such as Regulation XIII (New Source Review), Rule 1401 (New Source Review of Toxic Air Contaminants), or Rule 431.2 (Sulfur Content of Liquid Fuels).

SCAQMD Rule 402 – Nuisance. This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 – Fugitive Dust. The purpose of this Rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area to be visible beyond the emission source's property line. During Project construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities. These measures would include site watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to operations on a property with 50 or more acres of disturbed surface area, or for any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cy or more three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintaining dust control records, and designating a SCAQMD-certified dust control supervisor.

SCAQMD Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities. The purpose of this rule is to limit emissions of asbestos, a TAC, from structural demolition/ renovation activities. The rule requires the SCAQMD to be notified of proposed demolition/ renovation activities and to survey these structures for the presence of asbestos-containing materials (ACMs). The rule also includes notification requirements for any intent to disturb ACM; emission control measures; and ACM removal, handling, and disposal techniques. All proposed structural demolition activities associated with proposed Project construction would need to comply with the requirements of the Rule.

POLB/POLA Vessel Speed Reduction Program (VSRP). In May of 2001, the POLB, POLA, EPA Region 9, ARB, SCAQMD, the Pacific Merchant Shipping Association (PMSA), and the Marine Exchange of Southern California signed a MOU to voluntarily reduce the speed of OGV to 12 knots or less within 20 nm of Point Fermin. Reduction in speed demands less power on the main engine, which in turn reduces fuel usage and emissions. The CAAP adopted the VSRP as control measure OGV-1, but expands the program out to 40 nm from Point Fermin, as discussed in the following section.

POLB/POLA Switch Locomotive Modernization. Pacific Harbor Line (PHL) entered into an agreement with POLB and POLA to replace their antiquated switch locomotive engines with cleaner engines that meet the Tier II locomotive standards described above in the federal Regulations section. The first clean engine locomotive arrived in July 2007. As of April 2008, PHL has replaced engines in 13 of its 16 locomotives to Tier 2 standard (POLB 2008a). This agreement is equivalent to CAAP measure RL-1, as discussed below. In addition, they have taken delivery of five Tier 3 standard generators in their locomotives.

POLB Clean Trucks Program (CTP). On February 19, 2008, the POLB approved the POLB version of the Clean Trucks Program developed with the POLA and created as part of the CAAP. The POLB CTP requires drayage truck owners to scrap and replace about 16,000 polluting trucks working at the ports, with the assistance of a Port-sponsored grant or loan subsidy. Under the POLB "concession" plan, truckers can lease to own a new truck for as little as $500 a month, including pre-paid maintenance. They can choose to work as employees or owner operators. Beginning October 1, 2008, pre-1989 trucks will be banned. The program progressively bans all trucks that do not meet 2007 EPA emission standards by 2012. To finance the $2 billion truck replacement program, the POLB will levy a fee on loaded containers ($35 per loaded TEU) beginning October 1, 2008.

Port of Long Beach Green Port Policy

In November 2004, the Board of Harbor Commissioners directed the Port to develop a policy that would build on the existing Healthy Harbor program to encompass wide-ranging environmental goals. In January 2005, the Board of Harbor Commissioners adopted the Green Port Policy, which serves as a guide for decision making and established a framework for environmentally friendly Port operations. The goal of the air quality program element of the POLB Green Port Policy is to reduce harmful air emissions from Port activities (POLB 2005).

As a means to implement the Green Port Policy, the POLB, in conjunction with the POLA, and with guidance from SCAQMD, ARB, and EPA, adopted the CAAP on November 20, 2006. The CAAP focuses on reducing emissions with two main goals: (1) reduce Port-related air emissions in the interest of public health; and (2) accommodate growth in trade. The CAAP proposes to implement near-term measures largely through new lease agreements, the NEPA/CEQA process, and tariffs. The CAAP includes specific emission control measures for all Port emission sources, including OGV, trains, trucks, terminal equipment, and harbor craft.

The Port negotiated and signed environmentally-friendly "green" leases with several terminal customers. These "green" leases require environmental compliance that is above requirements by federal and state law. As a landlord port, leases are the primary mechanism for the Port to implement its environmental initiatives, including the CAAP.

Although there are no laws or regulations restricting ship speeds, the Port had significant success in 2006 with its pioneering Green Flag program, which offers environmental recognition and reduced fees for ships that consistently comply with the VSRP. Compliance with the Green Flag speed limits reached nearly 90 percent in 2007, a significant increase of more than 18 percent from the previous year, and resulted in substantial emission reductions.

The Port and its tenants have reduced emissions from terminal equipment by nearly 600 tons of NO_x and more than 70 tons of DPM per year compared to 2002 emissions. This has been accomplished through:

1. The Diesel Emissions Reduction Program; and
2. Accelerated replacement (modernization) of the terminal equipment fleets, even while cargo tonnage has increased by 30 percent. More than 600 pieces of cargo handling equipment have been retrofitted with diesel oxidation catalysts and half of those are using clean diesel fuel.

The Port initiated a two-year, multi-partner project in 2006 to develop and test hybrid-powered yard hostlers at one of the Port's major cargo facilities, the Long Beach Container Terminal (LBCT), which is also testing natural gas-powered yard hostlers.

In 2006, the Port approved a project to test a potential breakthrough technology that could reduce air pollution from ships at berth by as much as 95 percent. The system consists of a "bonnet" that fits over the exhaust stacks of ships at berth. Emissions captured by the system would flow to a dockside scrubber treatment system. Testing of this system is planned for 2008 at the Pier G bulk cargo terminal. If successful, this technology could be used for vessels that are not able to use shore-side electricity.

The Port measures progress toward the goals of its air quality program by: (1) development of periodic annual emission inventories of Port operations (years 2002 and 2005 to date); and (2) updates to the CAPP. These efforts allow the Port, the community, and regulators to assess the progress of air quality programs and determine the best use of resources to address air quality problems. In addition, the Port maintains air monitoring locations in the Port to provide the community information on current air quality conditions.

San Pedro Bay Standards

The POLB and the POLA are in the process of establishing the San Pedro Bay Standards (SPBS) which they will use as tools for future air quality planning. The SPBS will help the ports and air agencies to better understand and evaluate the long-term cumulative effects of future ports projects in conjunction with implementation of CAAP measures and existing regulations.

There are two components to the SPBS: (1) the Health Risk Reduction Standard, which proposes to reduce health risks from Port-related DPM emissions in residential areas surrounding the Ports by 85 percent in year 2023 compared to 2005 levels; and (2) the Emission Reduction Standard, which proposes to achieve a "fair share" reduction of Ports-related air emissions. These components address the primary air quality goals of the Port to reduce health risks to local communities from Port operations and to assist the region in attaining the ambient air quality standards. Once the SPBS are adopted, the Port will commit to revising the CAAP to require implementation of additional emissions control measures for purposes of achieving these goals.

The SPBS includes methodologies that will be used to assess whether a project is consistent with the SPBS. Based upon these current draft methodologies, a project would be consistent with the Health Risk and Emission Reduction Standards if:

1. The project environmental analysis is consistent with assumptions regarding the projected growth of operations at the Ports and the effect of existing CAAP and

regulatory measures that were used to develop the Standards;

2. The project complies with all then-applicable laws and regulations;

3. The project implements all applicable Project-Specific and Source Specific Standards in the then-existing version of the CAAP; and

4. The project environmental analysis assesses potentially practicable new emission reduction technologies beyond those required under the then-existing version of the CAAP, and imposes a requirement that the project use any such technologies found to be feasible, available, and effective at reducing emissions as needed to achieve the Standards.

Development of the SPBS is a complex process that includes input from several members of the SPBS Technical Working Group (TWG), comprised of representatives from the ARB, SCAQMD, and EPA. The ports recently completed the Draft SPBS, which is currently under review by members of the SPBS TWG. The Ports anticipate that agreement between the TWG and the Ports on the SPBS will be achieved shortly and at that time the Standards would be available for public review.

Climate Change/Greenhouse Gas Strategic Plan

The Port's commitment to protecting the environment from the harmful effects of Port operations, as stated in the Green Port Policy, necessitates the development of programs and projects to reduce GHG emissions. Although the state has yet to formalize GHG regulations for the goods movement sector, the Port has already begun work in this area. In September 2008, the Port's Board of Harbor Commissioners adopted a formal resolution establishing a framework for reducing GHG emissions. The framework outlined efforts that are already underway at the Port toward addressing the issue of climate change. These efforts include:

1. The Port collaborated with other city departments to produce the city's first voluntary GHG emissions inventory (calendar year 2007) which was submitted to the California Climate Action Registry (CCAR).

2. The Port joined other city departments in preparing a plan to increase energy efficiency in city-owned facilities, in turn reducing indirect GHG emissions from energy generation. This initiative is known as the Southern California Edison 2009-2011 Local Government Partnership.

3. The Port participates in tree planting and urban forest renewal efforts through its support of the City of Long Beach's Urban Forest Master Plan.

4. Port staff consulted with the Long Beach Gas and Oil Department (LBGO) and Tidelands Oil Production Company (Tidelands) to evaluate potential opportunities for capturing carbon dioxide produced by oil operations in the Harbor District and re-injecting (sequestration) it through wells at the Port back into the subsurface formations.

5. Beginning with the 2006 POLB air emissions inventory, GHG emissions from ocean-going vessels, heavy-duty trucks, cargo-handling equipment, harbor craft, and locomotives are quantified to enable the establishment of GHG reduction goals.

6. The Port's Renewable Energy Working Group is developing strategies to expand renewable energy at the Port. Criteria for emerging technologies will be established so that the technologies can be evaluated in a manner similar to the existing CAAP Technology Advancement Program (TAP).

7. The Port's Renewable Energy Working Group recently finalized a Solar Energy Technology and Siting Study ("Solar Siting Study") that reviewed available solar technologies and the estimated solar energy generation potential for the entire Harbor District. The study determined that there are many sites within the Harbor District where solar energy generating technologies could be developed on building rooftops and at ground-level.

8. Based on the Solar Siting Study, Port staff are developing a program to provide incentive funding to Port tenants for the installation of solar panels on tenant-controlled facilities.

The Port is developing a Climate Change/ Greenhouse Gas (CC/GHG) Strategic Plan (CC/GHG Plan). This plan will examine GHG impacts for all activities within the Harbor District and will identify strategies for reducing the overall carbon footprint of those activities. Similar to the CAAP, the Port's GHG/CC Plan will identify strategies for activities under direct Port control and those that are controlled by third parties, such as tenants. This Plan will also be used to mitigate potential project-specific and cumulative GHG impacts from future projects through modernization and/or upgrading of marine terminals and other facilities in the Long Beach Harbor District.

One element of the CC/GHG Plan is the Greenhouse Gas Emission Reduction Program Guidelines (GHG Guidelines). These Guidelines describe a procedure that the Port will use to select GHG emission reduction programs that meet the CC/GHG Plan reduction goals. The Guidelines were adopted by the Board of Commissioners on March 22, 2009. The Greenhouse Gas Emission Reduction Program (GHG Program) is included as **Mitigation Measure AQ-28**.

3.2.1.4 Existing Emissions at Middle Harbor Container Terminals

Existing Project operational sources almost exclusively use diesel fuels. These source activities include: (1) OGV cruising, maneuvering, and hoteling; (2) tugboat assistance to OGV; (3) handling of cargo within terminals and on-dock railyard by mobile equipment; (4) land transport of cargo by on-road trucks; and (5) locomotive switching activities within the on-dock railyard and land transport of cargo by trains.

Activity data used to estimate emissions from existing operational sources were obtained from the POLB, the proposed Project traffic study conducted as part of this EIS/EIR (Section 3.5), the *Port of Long Beach Air Emissions Inventory* (AEI) – *2005* (Starcrest Consulting Group, LLC 2007), and documents on the environmental review of proposed terminal development projects in the Ports (POLA 2007b). Emission factors used to estimate existing operational emissions were obtained from:

1. The ARB OFFROAD2007 Emissions Model (ARB 2006f) for terminal and railyard equipment;
2. The POLB 2005 AEI for vessel sources;
3. Special studies for locomotives (EPA 1997); and
4. The ARB EMFAC2007 mobile source emissions models for on-road trucks (ARB 2006e).

Appendix A-1 includes data and assumptions used to estimate emissions for existing Middle Harbor terminal operations. Table 3.2-5 summarizes the annual average daily emissions that occurred from existing operations at the Middle Harbor container terminals for the CEQA Baseline in 2005. These data were compared to annual average daily emissions from the Project and alternatives to determine their significance under CEQA. Total 2005 annual emissions were divided by 365 days to estimate annual average daily emissions.

The changes in the average daily baseline operational criteria pollutants emissions from the Draft EIS/EIR to the Final EIS/EIR are to a large extent due to significant reductions to the truck and commuter VMT estimates used in the Final EIS/EIR calculations, as described in the introductory section to Section 3.2.

Table 3.2-5 shows that the main contributors to emissions were on-road trucks, followed by OGV and terminal equipment. OGV transit emissions are due to propulsion activities between the berths at the Middle Harbor container terminals and the outer boundary of the SCAQMD waters (Figure 3.2-1). Truck and train usages and emissions occurred on-terminal and along roads and rail lines out to the boundaries of the SCAB.

Table 3.2-6 summarizes an estimation of the peak daily emissions that occurred from existing operations at the Middle Harbor container terminals for the CEQA Baseline in 2005. These data were compared to peak daily emissions from the Project and alternatives to determine their significance under CEQA. This new approach was taken, as it was deemed a more representative evaluation to compare peak baseline to peak future conditions.

Greenhouse Gas Emissions

Table 3.2-7 presents an estimate of annual GHG emissions generated from the operation of the Middle Harbor container terminals within California during the CEQA Baseline in 2005.

Changes in the GHG emissions resulting from the operation of the Middle Harbor container terminals within California during the CEQA Baseline in 2005 from the Draft EIS/EIR (Table 3.2-6) to the Final EIS/EIR (Table 3.2-7) are to a large extent due to major changes in the baseline commuter VMT and train trips, and to a lesser extent revisions to the baseline truck VMT estimates that are used in the Final EIS/EIR, as described in the introductory section to Section 3.2. These revisions resulted in operational CEQA Baseline GHG emissions in the Final EIS/EIR (Table 3.2-7) that are about 10 percent lower than those presented in the Draft EIS/EIR (Table 3.2-6).

Sources of existing facility GHG emissions include the following: (1) direct sources of ships, tugboats, terminal and railyard equipment, on-road trucks, trains, worker commute vehicles, and fugitive refrigerant losses from refrigerated containers (reefers); and (2) indirect sources of electrical power generation due to on-terminal electricity usage. The GHG emission calculation methodology is described in Appendix A-1.

GHG emissions associated with the Project scenarios generally were calculated with the methodologies provided in the CCAR Protocol. However, for this NEPA/CEQA analysis, it was necessary to modify the Protocol's operational and geographical boundaries to make the GHG analysis more consistent with CEQA and to avoid the omission of a significant number of mobile sources. For Project sources that travel outside of California (ships, line haul locomotives, and some trucks), GHG emissions were based on the following route lengths:

1. For on-road trucks, transit was along the following routes: (a) the average local trip distance and (b) the average distance between the Port and the California border for out-of-state truck trips;

2. For line haul trains, transit was between the Project terminal railyard and the eastern border of California; and

3. For OGV, ocean transit was along the shipping route between the Port and the State Water's three-mile jurisdictional boundary west of Point Conception. The analysis assumed that all Project ships would follow this "northern route." The northern route represents the longest distance that container ships would travel to and from the Port while in State Waters.

For the consumption of electricity generated offsite, all GHG emissions were included in the analysis without regard to whether they were generated within or outside of California, since in part, it was not possible to determine the exact source and location of power generation. This approach is consistent with the goal of CCAR to report all GHG emissions within the State of California (CCAR 2007). Additionally, use of the California boundary to delineate the domain for the estimation of Project GHG emissions is adequate to provide an indicator of the magnitude of proposed GHG emissions over existing levels.

In its review of the Draft EIS/EIR, the California DOJ provided public comments stating that the Draft EIS/EIR did not disclose the full extent of proposed GHG emissions because it did not include certain mobile source emissions that would occur outside of California, such as ship emissions in waters outside of the United States. While the Port and USACE disagree with this comment, this Final EIS/EIR provides an additional analysis that includes a best estimate of GHG emissions that would occur from the transport of proposed cargo both within and outside of California. A summary of these annual GHG emissions is provided in the response to comment DOJ-4 in Chapter 10. Appendix A.1.3 provides the documentation of these emission estimates.

3.2.2 Impacts and Mitigation Measures

The following analysis considers the air quality impacts that would occur from the Project and alternatives. Section 3.2.3 of this EIS/EIR also evaluates the cumulative air quality impacts that would occur from proposed Project construction and operational activities in combination with existing or reasonably foreseeable future projects.

For purposes of this EIS/EIR, the evaluation of significance under CEQA is determined by comparing impacts from the Project or its alternatives to the CEQA Baseline existing conditions of year 2005. The evaluation of NEPA impacts is determined by comparing impacts from the Project or its alternatives to the NEPA Baseline conditions. Project emissions that would occur within the SCAB were compared to each baseline.

3.2.2.1 Significance Criteria

The following thresholds were used in this EIS/EIR to determine the significance of Project air quality impacts for both NEPA and CEQA purposes, except for AQ-8 (GHG emissions) for which there is no NEPA significance determination (refer to the discussion under AQ-8 below). These criteria are identified in the *Air Quality and Risk Assessment Analysis Protocol for Proposed Projects at the Port of Long Beach* and are based on standards set by the SCAQMD and ARB (POLB 2007b).

Construction Impacts

Project construction would produce significant air quality impacts under the following circumstances:

AQ-1: The Project results in construction-related emissions that exceed any of the following SCAQMD daily thresholds of significance: (1) 75 pounds of VOCs; (2) 550 pounds of CO; (3) 100 pounds of NO_x; (4) 150 pounds of SO_x or PM_{10}; or (5) 55 pounds of $PM_{2.5}$; or

AQ-2: Project construction results in offsite ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance shown in Table 3.2-8. However, to evaluate Project impacts to ambient NO_2 levels, the analysis replaced the use of the current SCAQMD one-hour NO_2 threshold with the revised one-hour California ambient NO_2 standard of 338 $\mu g/m^3$, as this new standard constitutes the most stringent applicable requirement.

Operational Impacts

Project operations would produce significant air quality impacts under the following circumstances:

AQ-3: Project operational emissions exceed any of the following SCAQMD daily thresholds of significance: (1) 55 pounds of VOCs; NO_x, or $PM_{2.5;}$ (2) 550 pounds of CO; or (3) 150 pounds of SO_x or PM_{10};

AQ-4: Project operations result in offsite ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance in Table 3.2-9. However, to evaluate Project impacts to ambient NO_2 levels, the analysis replaced the use of the current SCAQMD NO_2 thresholds with the revised and more stringent one-hour and annual California ambient air quality standards of 338 and 56 $\mu g/m^3$, respectively, as this new standard constitutes the most stringent applicable requirement;

AQ-5: Project operational emissions create an objectionable odor pursuant to SCAQMD Rule 402 at the nearest sensitive receptor;

AQ-6: Project operations expose the public to significant levels of TACs. The determination of significance is based on the following:

- Maximum Increment Cancer Risk greater than or equal to 10 in one million (10×10^{-6});
- Maximum Increment Cancer Risk greater or equal to 10 in one million (10×10^{-6});
- Non-cancer (chronic or acute) Health Hazard Index (HHI) greater or equal to 1.0 (Project increment); or
- Cancer burden greater than 0.5;

AQ-7: Project operations conflict with or obstruct implementation of an applicable AQMP; or

AQ-8: The proposed Project would produce GHG emissions that exceed the following thresholds, (see Section 3.2.2.3, Impact AQ-8).

CEQA Threshold

There is currently little guidance and no local, regional, state, or federal regulation that establishes a threshold to address the significance criteria for the impacts of GHG emissions impact on climate change. Therefore, for this EIS/EIR the POLB utilizes the following as its CEQA threshold of significance:

- The proposed Project would result in a significant CEQA impact if CO_2e emissions exceed CEQA Baseline emissions.

In absence of further guidance, this threshold is the most conservative, as any increase over the CEQA Baseline would be considered significant. However, in the future the Port will be considering the use of the GHG thresholds under development by the Office of Planning and Research.

NEPA Threshold

The USACE has established the following position under NEPA: There are no science-based GHG significance thresholds, nor has the federal government or the state adopted any by regulation. In the absence of an adopted or science-based GHG standard, the USACE will not utilize the Port's proposed AQ-8 CEQA standard, propose a new GHG standard, or make a NEPA impact determination for GHG emissions estimated to occur from the proposed Project or any of the alternatives. Rather, in compliance with the NEPA implementing regulations, the anticipated emissions for each Project and alternative would be disclosed relative to the NEPA Baseline without expressing a judgment as to their significance.

3.2.2.2 Methodology

Air pollutant emissions from the proposed construction and operational activities were calculated using the most current emission factors and methods, then compared to the thresholds identified in Section 3.2.2.1 to determine their significance. For impacts that exceed a significance criterion, mitigation measures were applied to Project activities to determine their ability to reduce impacts to insignificance.

This EIS/EIR air quality analysis assumes that the mitigated Project would comply with all applicable CAAP measures. Project-specific mitigation measures applied to reduce air emissions and public health impacts are largely consistent with, and in some cases exceed, the emission-reduction strategies of the CAAP. Project mitigations also would extend beyond the five year CAAP time-frame to the end of the lease period in 2030.

Construction Emissions

Project construction activities would require the use of diesel-powered off-road construction equipment, on-road trucks, tugboats, and dredge/barge equipment that would produce combustive emissions in the form of VOC, CO, NO_x, SO_x, and PM. Main engines on dredging equipment would be electrified (minor auxiliary equipment on dredging barges would be diesel-powered). Equipment and vehicles traveling over unpaved surfaces and performing grading and earthmoving activities also would generate fugitive dust emissions in the form of PM. As part of the Project description, all land-based off-road construction equipment would meet the equivalent of EPA Tier 3 non-road standards.

Equipment usage and scheduling data needed to calculate emissions for proposed construction activities were obtained from the Port (POLB 2006). Emission factors used to estimate existing operational emissions were obtained from (1) the ARB OFFROAD2007 Emissions Model (ARB 2006f) for off-road equipment, (2) the ARB EMFAC2007 model for on-road trucks (ARB 2006g), and (3) special studies conducted by the EPA for fugitive dust (EPA 1995). Appendix A-1 includes data and assumptions used to estimate emissions for proposed construction activities.

To estimate peak daily construction emissions that were used to compare to the SCAQMD emission thresholds, daily emissions for each construction activity were calculated for the duration of their proposed calendar schedule. Peak daily emissions then were determined by identifying the maximum daily emissions that would occur from overlapping construction activities during the entire construction calendar schedule.

Operational Emissions

Future operation of the Middle Harbor container terminal would include the same types of emission sources as current operations (Table 3.2-5), except that it would exclude break-bulk operations and it would include an expanded Pier F intermodal railyard. Information on future operational emission sources was obtained from the POLB, the Project traffic study conducted as part of this EIS/EIR (Section 3.5), the POLB 2005 AEI (Starcrest 2007), and documents on the environmental review of proposed terminal development projects in the Ports (POLA 2007). Emission factors used to estimate future operational emissions were obtained from: (1) the ARB for OGV operations (ARB 2008b); (2) the ARB OFFROAD2007 Emissions Model (ARB 2006f) for terminal and railyard equipment; (3) the POLB 2005 AEI for vessel sources; (4) special studies for locomotives (EPA 1997 and 2008b); and (5) the ARB EMFAC2007 mobile source emissions model for on-road trucks (ARB 2006g). Appendix A-1 includes data and assumptions used to estimate emissions for proposed Middle Harbor container terminal operations.

Emissions were estimated for future milestones that coincide with proposed activities in years 2010, 2015, 2020, and 2030. For each Project alternative, the analysis made the following comparisons to assess operational air quality impacts:

- Project Alternative emissions for each development year minus existing terminal emissions in year 2005 (Table 3.2-5) were compared to the SCAQMD emission thresholds to determine CEQA significance.
- Project Alternative emissions for each development year minus the NEPA Baseline emissions (Table 3.2-13) for the same year were compared to SCAQMD emission thresholds to determine NEPA significance.

Proposed Environmental Controls for Construction and Operations

This analysis assumes that each Project scenario would operate in compliance with approved and applicable regulations identified in Section 3.2.1.3.

Construction

Table 3.2-10 identifies the regulations and control measures assumed for the unmitigated Project construction scenarios. Summaries of these emission control measures that were included in the analysis include the following:

- ***Tugboats (added in Final EIS/EIR)*** – The analysis assumes that tugboats used in the unmitigated and mitigated construction scenarios would turn over to EPA Tiers 2 through 4 standards, based upon the composite SCAB harbor craft fleet developed by the ARB for the implementation of the ARB Commercial Harbor Craft Regulation (Starcrest 2008). Therefore, as construction progresses, the average emission factors for tugboats would improve each year. For example, by year 2013/2015, the composite fleet emission factors would reach Tiers 2/3 emission levels (Appendix A-1 Table A.1.1-Alt 1-42).

- ***Construction Equipment*** – Construction contractors would use construction equipment that achieve EPA Tier 3 non-road equivalent standards at a minimum.
- ***Electrification of Dredge Equipment*** – With the exception of auxiliary barge equipment, dredge equipment would use shore-side electricity to power dredge equipment during construction.
- **Ultra-Low Sulfur Diesel (*added in Final EIS/EIR)*** – All construction equipment would use diesel fuel with a sulfur content of 15 ppm.

Operations

The unmitigated Project scenarios include CAAP measures that are Port-wide and would occur regardless of terminal lease agreements. In addition, as part of the Port's commitment to promote the POLB Green Port Policy and implement the CAAP, the mitigated operational activities associated with Alternative 1, Alternative 2, Alternative 3, and the NEPA Baseline include all applicable CAAP control measures and additional clean air technologies. Due to this high level of emission control, few feasible mitigation measures are available to further reduce proposed Project emissions and air quality impacts.

Table 3.2-11 identifies the regulations/CAAP measures assumed for each Project operational scenario.

Summaries of the emission control measures that the analysis considered as part of the Project unmitigated operational scenarios include the following:

- ***Expanded VSRP –*** All OGV that call at the Middle Harbor container terminal would comply with the expanded VSRP of 12 knots from 40 nm, that is, from Point Fermin to the Precautionary Area (equal to CAAP measure OGV1). Vessels that called at the Project terminal during the 2005 baseline year achieved a 99 percent compliance rate with the original VSRP that extends out 20 nm from Point Fermin.
- ***ARB Fuel Sulfur Regulation for OGV* (*added in Final EIS/EIR)*** – OGV would use 1.5 percent sulfur diesel fuel in main engines, auxiliary generators and boilers prior to 2012. Beginning in 2012, these sources would use 0.1 percent sulfur diesel fuel.
- ***ARB At-Berth OGV Regulation for Auxiliary Engines* (*added in Final EIS/EIR)*** – OGV would control at-berth emissions from auxiliary generators by 50 percent by 2014, 70 percent by 2017, and 80 percent by 2020.
- ***Locomotives* (*modified in Final EIS/EIR to include EPA Tier 3 Regulation)*** – Consistent with completed CAAP measure RL-1, all switch locomotives that operate within the Project railyard would have engines that meet EPA Tier 2 standards. Beginning in 2025, both line haul and switch locomotives would achieve EPA Tier 3 equivalent standards, based on EPA-estimated remanufacturing rates and new purchases assumed in this rule development.
- ***Heavy-Duty Trucks*** – Trucks that call at the Middle Harbor container terminal would comply with the ARB Port Truck Regulation Fleet. This assumption was used to show the benefit of implementing the POLB Clean Truck Program in the unmitigated scenarios.

Summaries of the emission control measures that the analysis considered as part of the mitigated scenarios for Alternatives 1 and 2, Alternative 3, and the NEPA Baseline include the following:

- ***Shore-to-Ship Power ("Cold Ironing")*** – OGV that call at the Middle Harbor container terminal would utilize shore-to-ship power while at berth (equal to CAAP measure OGV2). The air quality analysis assumed that three new berths with the capacity to cold-iron OGV would become available according to the following Project construction schedule: (1) December 2009; (2) March 2012; and (3) December 2014. As each of these berths become available, they would cold-iron one-third of the total annual ship visits, so by 2015, all Project ship visits would cold-iron. Since lease stipulations would allow for alternative technologies to achieve 90 percent of the emission reductions of cold-ironing, the air quality analysis only assumed this level of control for OGV that cold-iron.

- ***Low-sulfur Fuels in OGV*** – All OGV would use 0.2 percent or lower sulfur diesel fuel in vessel auxiliary and main engines at berth and out to a distance of 40 nm from Point Fermin, or equivalent reduction (equal to CAAP measures OGV3 and OGV4). Beginning in 2012, all sources would use 0.1 percent sulfur diesel fuel, consistent with the requirements of the ARB Fuel Sulfur Regulation for OGV.
- ***Container Handling Equipment*** – All CHE would meet the following performance standards (equal to CAAP measure CHE1):
  - By the end of 2010, all yard tractors operating at the Port would meet, at a minimum, the EPA non-road Tier 4 engine standards;
  - By the end of 2012, all pre-2007 on-road or pre Tier 4 off-road top picks, forklifts, reach stackers, rubber-tired gantry cranes (RTGs), and straddle carriers less than 750 Hp would meet, at a minimum, the EPA non-road Tier 4 engine standards; and
  - By the end of 2014, all CHE with engines greater than 750 Hp would meet, at a minimum, the EPA Tier 4 non-road standards. Starting in 2009 (until equipment is replaced with Tier 4), all CHE with engines greater than 750 Hp would install the cleanest available verified diesel emission control (VDEC), as established by the ARB.
- ***Heavy-Duty Trucks*** – Trucks that call at the Middle Harbor container terminal would comply with the POLB Clean Truck Program (similar to CAAP measure HDV1), which would replace all Port trucks that do not meet the EPA 2007 Heavy-Duty Highway Rule emission standards by 2012.

Greenhouse Gases

The air quality analysis includes an estimate of direct and indirect GHG emissions that would result from proposed construction and operational activities. Sources that may directly contribute to GHG releases considered in the analysis are identical to those included in this subsection for criteria pollutant impacts. Indirect emissions included in the analysis were from the generation of electricity needed for terminal operations and OGV cold-ironing.

GHG emissions associated with the proposed Project and alternatives generally were calculated based on methodologies provided in the *CCAR Protocol.* The CCAR Protocol is the guidance document that CCAR members use to prepare annual port-wide GHG inventories for the Registry. The CCAR Protocol method divides emissions into three categories:

- Scope 1: Direct emissions from sources owned or operated by a member;
- Scope 2: Indirect emissions from purchased and consumed electricity; and
- Scope 3: Indirect emissions from sources not owned or operated by a member.

CCAR requires the reporting of Scope 1 and Scope 2 emissions but does not require Scope 3 emissions because they are considered to belong to another reporting entity (i.e., whomever owns, leases, or operates the sources), and that entity would report these emissions as Scope 1 emissions in its own inventory. However, this NEPA/CEQA analysis calculated GHG emissions for all Project-related sources (Scopes 1, 2, and 3). Since CCAR does not require reporting of Scope 3 emissions, they have not developed assumptions for operational or geographical boundaries of some Scope 3 emissions sources, such as ships. Therefore, for Project sources that travel outside of California (ships, line haul locomotives, and some trucks), GHG emissions were based on the boundaries described in section 3.2.1.4 and Appendix A-1.3 of this Final EIS/EIR.

As stated in Section 3.2.1.4 of this Final EIS/EIR, response to comment DOJ-4 in Chapter 10 provides an additional analysis that includes a best estimate of GHG emissions that would occur from the transport of proposed cargo both within and outside of California. Appendix A.1.3 provides the documentation of these emission estimates.

<u>Construction</u>

The Project-related construction sources for which GHG emissions were calculated include: (1) off-road diesel construction equipment; (2) on-road trucks; (3) tugboats and barge equipment used in dredge/fill and wharf construction activities; and (4) worker commute vehicles.

<u>Operations</u>

The Project-related operational emission sources for which GHG emissions were calculated include:

(1) OGV; (2) tugboats; (3) terminal equipment; (4) railyard equipment; (5) on-road trucks; (6) trains; (7) fugitive refrigerant emissions from refrigerated containers; (8) electricity consumption from cold-ironing; (9) on-terminal electricity consumption; and (10) worker commute vehicles.

Appendix A-1.3 includes data and assumptions used to estimate GHG emissions for proposed construction and operational activities.

NEPA Baseline

For purposes of this EIS/EIR, the evaluation of significance under NEPA is defined by comparing impacts from the Project and alternatives to the NEPA Baseline. The NEPA Baseline would include construction of site improvements and operational activities that could occur without issuance of federal permits. Therefore, the baseline would not include any in-water activities (e.g., dredging, filling, and/or new wharf construction). Existing wharf infrastructure would not be improved and channel and berth deepening would not occur. However, due to the local and regional demand for higher levels of containerized shipping, the Middle Harbor container terminal would experience market-driven increases in throughput. The NEPA Baseline includes construction of the Pier E Substation, shore-to-ship infrastructure to cold-iron vessels while at berth, the mainline track realignment at Ocean Boulevard/Harbor Scenic Drive, and the Pier F storage yard and tracks, but the baseline would not include construction of the Pier F tail track. Due to the limited onsite container terminal acreage, this baseline would include expanding the existing Pier F intermodal railyard to six tracks that would provide an approximately 25-acre joint terminal intermodal railyard.

Table 3.2-12 presents estimates of the daily emissions associated with each construction phase/stage under the NEPA Baseline. Due to the terminal improvements, both physical and operational, that would occur under the NEPA Baseline, operational activities and cargo throughputs would increase in future years compared to existing conditions in 2005.

The NEPA Baseline is equivalent to Alternative 4. The peak daily emissions operational emissions for the NEPA Baseline are presented in Table 3.2-49 and are discussed in Section 3.2.2.6.

Table 3.2-13 summarizes the annual average daily emissions that would occur with operations at the Middle Harbor container terminal under the NEPA Baseline for years 2010, 2015, 2020, and 2030. These data were compared to annual average daily and peak daily emissions from the Project alternatives to determine their significance under NEPA. Appendix A-1 includes data and assumptions used to estimate operational emissions for the NEPA Baseline scenario.

The changes in average daily criteria pollutants operational emissions associated with NEPA Baseline from the Draft EIS/EIR (Table 3.2-11) to the Final EIS/EIR (Table 3.2-13) are to a large extent due to significant changes in the truck VMT estimates used in the Final EIS/EIR analysis, as described in the introductory section to Section 3.2. These revisions result in NEPA Baseline operational emissions in the Final EIS/EIR which are higher than those presented in the Draft EIS/EIR for all years.

Table 3.2-14 presents estimates of annual GHG emissions that would occur from the operation of the NEPA Baseline within California for Project years 2010, 2015, 2020, and 2030. Sources considered in the analysis include those considered for Project criteria pollutant impacts, plus indirect emissions that would occur from the generation of electricity needed for terminal operations and OGV cold-ironing.

The changes in annual GHG emissions associated with terminal the NEPA Baseline operations from the Draft EIS/EIR (Table 3.2-12) to the Final EIS/EIR (Table 3.2-14) are to a large extent due to significant reductions in truck VMT estimates and to a lesser extent revisions in the commuter VMT estimates used in the Final EIS/EIR analysis, as described in the introductory section to Section 3.2. These revisions result in NEPA Baseline operational GHG emissions in the Final EIS/EIR that are much lower than those presented in the Draft EIS/EIR.

Health Risks

The Project HRA was conducted in accordance with the "*Air Quality and Risk Assessment Analysis Protocol for Proposed Projects at the POLB"* (POLB 2007b); the California Office of Environmental Health Hazard Assessment (OEHHA) "*Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments"* (OEHHA 2003); the SCAQMD's "*Supplemental Guidelines for Preparing Risk Assessments for Toxics "Hot Spots" Information and Assessment Act (AB 2588)"* (SCAQMD 2005a); and "*Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions"* (SCAQMD 2003). The HRA evaluated individual lifetime cancer risks, cancer burden, and chronic and acute non-cancer hazard indices associated with the proposed Project. Additional details of the HRA methodology and inputs are described in Section 3.2.2.3 under **Impact AQ-6** and in Appendix A-3.

3.2.2.3 Alternative 1 – 345-Acre Alternative (the Project)

Construction Impacts

Impact AQ-1: Proposed Project construction would produce emissions that exceed SCAQMD emission significance thresholds.

Table 3.2-15 presents an estimate of the unmitigated daily air emissions that would occur during each phase/stage of Project construction. To determine the significance of Project emissions based on criterion AQ-1, the analysis included a review of the proposed construction schedule to determine a peak daily period of activity and resulting emissions for comparison to the SCAQMD daily emission thresholds.

CEQA Impact Determination

As shown in Table 3.2-15, during a peak day of activity, Project construction would produce significant levels of VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$ emissions. Therefore, these levels would represent significant air quality impacts under CEQA. The main source of combustive emissions would be tugboats; which are use to assist in wharf construction, dredging, and dike construction activities. With regard to PM_{10} and $PM_{2.5}$ emissions, the overwhelming majority of the emissions would occur in the form of fugitive dust.

Mitigation Measures

The following mitigation measure was applied to Project construction to reduce significant levels of PM_{10}/$PM_{2.5}$ emissions. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, no feasible mitigation measures are available to further reduce combustive emissions from proposed sources.

AQ-1: Additional Fugitive Dust Controls. The calculation of unmitigated fugitive dust emissions from Project earth-moving activities is based on Project compliance with SCAQMD Rule 403, which is assumed to produce a 75 percent reduction in PM_{10} emissions from uncontrolled levels to simulate rigorous watering of the site and use of other measures. To provide a 90 percent reduction of fugitive dust emissions from uncontrolled levels, the Project construction contractor shall develop and implement dust control methods that shall achieve this control level in a SCAQMD Rule 403 dust control plan; and designate personnel to monitor the dust control program and order increased watering, as necessary, to ensure a 90 percent control level. Their duties shall include holiday and weekend periods when work may not be in progress.

Additional control measures to reduce fugitive dust shall include, but are not limited to, the following:

- Apply approved non-toxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas or replace groundcover in disturbed areas;
- Provide temporary wind fencing around sites being graded or cleared;
- Cover truck loads that haul dirt, sand, or gravel or maintain at least two feet of freeboard in accordance with Section 23114 of the California Vehicle Code;
- Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off tires of vehicles and any equipment leaving the construction site;
- Suspend all soil disturbance activities when winds exceed 25 mph as instantaneous gusts or when visible dust plumes emanate from the site and stabilize all disturbed areas;
- Appoint a construction relations officer to act as a community liaison concerning onsite construction activity including resolution of issues related to PM_{10} generation;
- Sweep all streets at least once a day using SCAQMD Rule 1186.1 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water);
- Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces;
- Pave road and road shoulders; and
- Apply water three times daily or as needed to areas where soil is disturbed.

AQ-2: Emission Controls for Non-road Construction Equipment. Although not quantified in the analysis, to reduce combustive emissions, construction equipment shall meet the EPA Tier 4 non-road engine standards, where feasible. The Tier 4 standards become available starting in year 2012.

AQ-2a: Best Management Practices (BMPs) for Construction Equipment. The construction contractor shall implement the following BMPs on construction equipment, where feasible, to further reduce emissions from these sources.

- Use of diesel oxidation catalysts and/or catalyzed diesel particulate traps, as feasible.
- Maintain equipment according to manufacturer specifications.
- Restrict idling of equipment and trucks to a maximum of five minutes (per ARB regulation).
- Use of high-pressure fuel injectors on diesel-powered equipment.
- Use of electricity from power poles rather than temporary diesel- or gasoline-powered generators.

AQ-2b: Construction Traffic Emission Reductions. The construction contractor shall implement the following measures to further reduce emissions from construction.

- Trucks used for construction (a) prior to 2015 shall use engines certified to no less than 2007 NOx emissions standards and (b) in 2015 and beyond shall meet EPA 2010 emission standards.
- Provide temporary traffic control such as flag person, during all phases of construction to maintain smooth traffic flow.
- Schedule construction activities that affect traffic flow on arterial systems to off-peak hour where possible.
- Re-route construction trucks away from congested streets or sensitive receptor areas.
- Provide dedicated turn lanes for movement of construction trucks and equipment on- and offsite.
- Configure construction parking to minimize traffic interference.
- Improve traffic flow by signal synchronization.
- All vehicle and equipment will be properly tuned and maintained according to manufacturer specification.
- Reduce traffic speeds on all unpaved roads to 15 mph or less.

AQ-3: Emission Controls for Construction Tugboats. The unmitigated Project analysis assumes partial implementation of Tier 2 engine standards on construction tugboats. Although not quantified in the analysis, to reduce combustive emissions, all tugboats used in construction shall meet the EPA Tier 2 marine engine standards, and if feasible use construction tugs that meet the EPA Tier 3 marine engine standards. The Tier 3 standards become available starting in year 2009.

AQ-3a: Construction Tugboat Home Fleeting. The construction contractor shall require all construction tugboats that home fleet in the SPBP to (a) shut down their main engines and (b) refrain from using auxiliary engines while they are docked or to use electrical shore power, if need be.

Significance of Impacts after Mitigation

Table 3.2-15 shows that implementation of **Mitigation Measure AQ-1** would substantially reduce emissions of PM_{10} and $PM_{2.5}$. However, mitigated construction emissions under CEQA would exceed the VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$ SCAQMD emission thresholds. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would reduce emissions of VOC, CO, NOx, PM_{10}, and $PM_{2.5}$. However, these emissions would remain significant under CEQA.

<ins>NEPA Impact Determination</ins>

As shown in Table 3.2-15, during a peak day of activity, Project construction would produce significant levels of VOC, CO, NO_x, PM_{10} and $PM_{2.5}$ emissions. Therefore, these represent significant air quality impacts under NEPA. The main source of emissions would be tugboats, which are use to assist in wharf construction, dredging, and dike construction activities.

Mitigation Measures

Mitigation Measures AQ-1 through AQ-3a would apply to this impact. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce combustive emissions from proposed sources.

Significance of Impacts after Mitigation

Table 3.2-15 shows that implementation of **Mitigation Measure AQ-1** would reduce emissions of PM_{10} and $PM_{2.5}$. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would reduce emissions of VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$. However, mitigated construction emissions under NEPA would exceed the SCAQMD significance thresholds for VOC, CO, and NO_x. As a result, these emissions would remain significant under NEPA.

Impact AQ-2: Proposed Project construction would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate the ambient offsite impacts of Project construction emissions. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structures and scaling concepts, including treatment of both ground-level and elevated sources, and in both simple and complex terrain. The analysis focused on a peak day of emissions from fugitive dust and onsite construction equipment and haul trucks, since the SCAQMD only requires analysis of onsite construction emission sources for criteria pollutant impacts (personal communication, Koizumi, J. 2005). Therefore, the criteria modeling analysis did not consider offsite emission sources from truck hauling and tugboat/barge activities. Those emissions are addressed under **Impact AQ-1**. Appendix A-2 summarizes the Project construction emissions included in the dispersion modeling analysis.

Table 3.2-16 presents the maximum ambient offsite impacts estimated for unmitigated Project construction activities. Peak day emissions of CO and NO_2 would occur during Phase 1/Stage 1 and be due to: (1) container yard paving; (2) E24 wharf construction; (3) roll surcharge; (4) sheet pile bulkhead demolition; and (5) ground improvements associated with Pier D activities. Peak day emissions of PM_{10} and $PM_{2.5}$ would occur during simultaneous Phase 1/Stage 4, Phase 1/Stage 5, and Phase 2/Stage 2 activities that are due to: (1) Seaside Railyard area redevelopment; (2) development of the terminal north of Ocean Blvd.; (3) building construction; and (4) E23 wharf construction.

The changes in the Project's unmitigated ambient construction CEQA impacts from the Draft EIS/EIR (Table 3.2-14) to the Final EIS/EIR (Table 3.2-16) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

<u>CEQA Impact Determination</u>

The data in Table 3.2-16 show that the maximum offsite 24-hour PM_{10} incremental impact of 40.4 $\mu g/m^3$ would exceed the SCAQMD significance threshold of 10.4 $\mu g/m^3$. As a result, unmitigated emissions from Project construction would produce a significant ambient 24-hour PM_{10} impact under CEQA. All other pollutant impacts would remain below significance levels.

Mitigation Measures

Implementation of **Mitigation Measure AQ-1** would reduce emissions of fugitive dust ($PM_{10}/PM_{2.5}$) during Project construction. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce NO_2 emissions. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would reduce combustive emissions and their resulting ambient impacts from proposed construction.

Significance of Impacts after Mitigation

The data in Table 3.2-17 show a maximum mitigated offsite 24-hour PM_{10} incremental impact of 17.1 $\mu g/m^3$, which would exceed the SCAQMD threshold of 10.4 $\mu g/m^3$. As a result, after mitigation, Project construction emissions would remain significant for 24-hour PM_{10} impact under CEQA. All other pollutant impacts would remain below significance levels.

The changes in the Project's mitigated ambient construction CEQA impacts from the Draft EIS/EIR (Table 3.2-15) to the Final EIS/EIR (Table 3.2-17) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

<u>NEPA Impact Determination</u>

Unmitigated Project construction activities would produce ambient offsite impacts that would exceed the SCAQMD 24-hour PM_{10} significance threshold. Therefore, unmitigated emissions from Project construction would produce a significant air quality impact under NEPA that is identical to the Project impact under CEQA (Table 3.2-16).

The changes in the Project's unmitigated ambient construction NEPA impacts from the Draft EIS/EIR (Table 3.2-14) to the Final EIS/EIR (Table 3.2-16) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Mitigation Measures

Implementation of **Mitigation Measure AQ-1** would reduce emissions of fugitive dust (PM_{10}/$PM_{2.5}$) during Project construction. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce combustive emissions from proposed construction sources. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would reduce combustive emissions and their resulting ambient impacts from proposed Project construction activities.

The changes in mitigated ambient construction NEPA impacts from the Draft EIS/EIR (Table 3.2-15) to the Final EIS/EIR (Table 3.2-17) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Significance of Impacts after Mitigation

The data in Table 3.2-17 show that after mitigation, the maximum offsite 24-hour PM_{10} incremental impact of 17.1 $\mu g/m^3$ would exceed the SCAQMD significance threshold of 10.4 $\mu g/m^3$. As a result, after mitigation, Project construction emissions would remain significant for the 24-hour PM_{10} impact under NEPA. All other pollutant impacts would remain below significance levels.

Operational Impacts

Impact AQ-3: The proposed Project would result in operational emissions that exceed SCAQMD thresholds of significance.

Table 3.2-18 presents an estimate of the unmitigated annual average daily air emissions that would occur from the proposed Project operations for milestone years 2010, 2015, 2020, and 2030.

The changes in the unmitigated average daily Project operational criteria pollutants emissions from the Draft EIS/EIR (Table 3.2-16) to the Final EIS/EIR (Table 3.2-18) are to a large extent due to: (1) increases in the truck and commuter VMT estimates; (2) use of new ARB vessel operations emission factors; and (3) use of 1.5 percent rather than 0.2 sulfur diesel in OGV in year 2010, as described in the introductory section to Section 3.2.

The main contributors to Project operational emissions in year 2010 would include: (1) on-road trucks; (2) terminal equipment; (3) container ships in cruise mode outside the Port breakwater; and (4) vessels at berth in hoteling mode. Over time, vessel and train sources would produce a greater percentage of total Project emissions, as: (1) OGV main power plants currently are not subject to agency-adopted requirements to meet lower emissions standards; (2) the national line haul locomotive fleet simulated with the current 1997 EPA Rule has a slow turnover rate to cleaner standards (although the analysis simulates implementation of recently adopted EPA Tier 3 standards in 2025); and (3) proposed train trips generated by the Project railyard would increase by a factor of 14 between 2005 and 2030. Conversely, all other unmitigated Project emission source categories would turn over to future emission standards that would substantially reduce their emissions with time, due to the replacement of old vehicles.

Table 3.2-19 presents an estimate of the unmitigated peak daily air emissions that would occur from Project operations during a hypothetical day of peak shipping and cargo handling activities for each milestone year. These data are provided to satisfy SCAQMD reporting requirements. The data in Table 3.2-19 show that peak daily emissions are substantially higher than annual average daily emissions. However, annual average daily emissions discussed in Table 3.2-18 are more representative of typical Port conditions, as peak daily conditions occur more infrequently and they are based on more theoretical sets of assumptions.

The changes in the unmitigated peak daily Project operational criteria pollutants emissions from the Draft EIS/EIR (Table 3.2-17) to the Final EIS/EIR (Table 3.2-19) are due to: (1) increases in the truck and commuter VMT estimates; (2) use of new ARB vessel operations emission factors; (3) use of 1.5 percent rather than 0.2 sulfur diesel in OGV in year 2010; and (4) use of a peak day CEQA Baseline scenario for comparison to proposed emissions, as described in the introductory section to Section 3.2.

<u>CEQA Impact Determination</u>

CEQA impacts for annual average daily emissions were calculated by subtracting the CEQA Baseline emissions (Table 3.2-5) from the unmitigated Project operational emissions for each analysis year (Table 3.2-18). These results, which are presented in the “Net Change from 2005 CEQA Baseline” rows in Table 3.2-18, show that in all future years, the unmitigated Project would produce lower operational emissions compared to the CEQA

Baseline levels in 2005. This is the case since, due to currently adopted regulations (Table 3.2-11) most unmitigated Project vehicle fleets would turn over to substantially lower emission standards with time, compared to 2005 existing conditions. These lower emission rates would offset throughput increases and activities associated with the Project. As a result, the unmitigated Project would not exceed any SCAQMD daily emission thresholds and it would produce less than significant daily emissions under CEQA.

CEQA impacts for peak daily emissions were calculated by subtracting the peak daily CEQA Baseline emissions (Table 3.2-6) from the unmitigated peak daily Project operational emissions for each analysis year in Table 3.2-19. These results, which are presented in the “Net Change from 2005 CEQA Baseline” rows in Table.3.2-19, show that in all future years, the unmitigated Project would produce lower operational emissions compared to the CEQA Baseline levels in 2005, except for NOx emissions in 2010. As a result, the unmitigated Project would produce less than significant peak daily emissions under CEQA, except for NOx emissions in 2010.

Mitigation Measures

The following mitigation measures were applied to proposed Project operations to reduce significant levels of criteria pollutant emissions. The emission reductions associated with these mitigation measures are shown in Tables 3.2-20 (average daily emissions) and 3.2-21 (peak daily emissions). No additional feasible measures are available for consideration at this time.

AQ-4: Expanded VSRP. All OGV that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from 40 nm, i.e., from Point Fermin to the Precautionary Area. This measure equates to CAAP measure OGV1.

AQ-5: Shore-to-Ship Power (“Cold Ironing”). All OGV that call at the Middle Harbor container terminal shall utilize shore-to-ship power while at berth according to the following schedule: (1) 33 percent of all OGV by December 2009 (2) 66 percent of all OGV by March 2012, and (3) 100 percent of all OGV by December 2014. Lease stipulations shall include consideration of alternative technologies that achieve 90 percent of the emission reductions of cold-ironing.

AQ-6: Low-sulfur Fuels in OGV. All OGV shall use 0.2 percent or lower sulfur MGO fuel in vessel auxiliary and main engines at berth and out to a distance of 40 nm from Point Fermin, or implement equivalent emission reductions. This measure equates to CAAP measures OGV3 and OGV4.

AQ-7: Container Handling Equipment. All Project CHE shall meet the following performance standards. This measure equates to CAAP measures CHE1:

- By the end of 2010, all yard tractors shall meet, at a minimum, the EPA non-road Tier 4 engine standards;
- By the end of 2012, all pre-2007 on-road or pre-Tier 4 non-road top picks, forklifts, reach stackers, RTGs, and straddle carriers less than 750 Hp shall meet, at a minimum, the EPA non-road Tier 4 engine standards; and
- By the end of 2014, all CHE with engines greater than 750 Hp shall meet, at a minimum, the EPA Tier 4 non-road engine standards. Starting in 2009 (until equipment is replaced with Tier 4), all CHE with engines greater than 750 Hp shall install the cleanest available VDEC, as established by the ARB.

AQ-7a: High Efficiency Rail Mounted Gantry (RMG) Cranes. The Project terminal operator shall replace all diesel-powered RTGs with electric-powered RMGs, as soon as feasible, but no later than the completion of construction in 2020. Each RMG shall include high efficiency, regenerative drive systems.

AQ-8: Heavy-Duty Trucks. Container trucks that call at the Middle Harbor container terminal shall comply with the following replacement schedule as part of the POLB CTP tariff. This measure goes beyond the ARB’s requirements for reducing truck emissions. It is similar to CAAP measure HDV1 (CTP). However, it is more stringent and would result in the following:

- Ban pre-1989 trucks by 10/1/2008;
- Ban 1989-1993 trucks by 1/1/2010;
- Ban un-retrofitted 1994-2003 trucks by 1/1/2010; and
- Ban all trucks that do not meet the EPA 2007 Heavy-Duty Highway Rule emission standards by 1/1/2012.

Under **Mitigation Measure AQ-8**, the truck emission reductions were analyzed assuming all engines would continue to burn diesel. This is conservative as the CTP proposed to convert 50 percent of the fleet to LNG, which would result in lower emissions for the mitigated Project than analyzed.

Although not quantified in the analysis of the mitigated Project operational emissions, the following would result in reductions in criteria pollutant emissions from Project operations.

AQ-9: Clean Railyard Standards. The expanded Pier F intermodal railyard shall incorporate the cleanest locomotive technologies into its operations.

Technologies that reduce fuel consumption or use alternative fuels would reduce criteria pollutant emissions. These include diesel-electric hybrids, multiple engine generator sets, use of alternative fuels, and idling shut-off devices. Because some of these systems are not yet available, but are expected to be available within the next few years, this measure has not been quantified. However, implementation of this measure would reduce the Project's criteria pollutant emissions by less than 0.1 percent.

AQ-10: Truck Idling Reduction Measures. The Middle Harbor container terminal operator shall minimize on-terminal truck idling and emissions. Potential methods to reduce idling include, but are not limited to (1) maximize the durations when the main gates are left open, including during off-peak hours, and (2) implement a container tracking and appointment-based truck delivery and pick-up system to minimize fuel consumption and resulting criteria pollutant emissions. The estimate of unmitigated on-terminal trucking emissions considered the efficiencies of movement designed into the proposed Middle Harbor container terminal and, therefore, assumed a low rate of on-terminal idling. Nevertheless, additional design measures proposed in **Mitigation Measure AQ-10** would further reduce on-terminal truck activities and associated criteria pollutant emissions. However, this measure was not quantified.

AQ-11: Slide Valves on OGV Main Engines. OGV that call at the Project container terminal shall have slide fuel valves installed on their main engines, or implement an equivalent emission reduction technology. This retrofit is most applicable to OGV with MAN B&W engines. This technology would reduce emissions of VOC, NO_x, and DPM from OGV main engines.

AQ-25: Periodic Technology Review. To promote new emission control technologies, the tenant shall implement in 2015 and every five years following the effective date of the lease agreement, a review of new air quality technological advancements, subject to mutual agreement on operational feasibility, technical feasibility, and cost-effectiveness and financial feasibility, which agreement shall not be unreasonably withheld. If a technology is determined to be feasible in terms of cost, technical and operational feasibility, the tenant shall work with the Port to implement such technology.

AQ-26: Cargo Throughput Monitoring. Every five years, the Port shall compare actual cargo throughput that occurred at the terminal to the cargo assumptions used to develop the Final EIS/EIR. The years used in this analysis shall include 2015, 2020, 2025, and 2030. The Port shall calculate annual air emissions associated with these throughput levels (for OGV, assist tugs, locomotives, cargo handling equipment, and trucks) and compare them to the annual air emissions presented in the Final EIS/EIR. If actual emissions exceed those presented in the Final EIS/EIR, then new/additional mitigations would be applied through **Mitigation Measure AQ-25**.

Significance of Impacts after Mitigation

Table 3.2-20 presents an estimate of the mitigated annual average daily emissions that would occur from proposed Project operations in years 2010, 2015, 2020, and 2030. Table 3.2-20 shows that implementation of **Mitigation Measures AQ-4 through AQ-8** would reduce combustive emissions during all Project years from unmitigated levels. The net change in average daily operational emissions between the mitigated Project and CEQA Baseline would not exceed the SCAQMD daily emission significance thresholds for any pollutants. As a result, the mitigated Project would produce insignificant daily emissions of these pollutants during an average day of activity under CEQA.

Table 3.2-21 shows that in all future years, the net change in peak daily operational emissions between the mitigated Project and CEQA Baseline would not exceed the SCAQMD daily significance thresholds for any pollutants. As a result, the mitigated Project would produce insignificant daily emissions of all pollutants during a peak day of activity under CEQA.

Although not quantified, **Mitigation Measures AQ-7a, AQ-9 through AQ-11 and AQ-25 and AQ-26** would further reduce combustive emissions from Project operations in future years. Some of these control measure would get implemented after 2010, the peak year for emissions.

Comparisons of the CEQA increments for the mitigated annual average and peak daily operational emissions presented in the Draft EIS/EIR (Tables 3.2-18 and 3.2.-19, respectively) and the Final EIS/EIR (Tables 3.2-20 and 3.2.-21, respectively) are shown in Table 3.2-60. Although there were emission increases between the Draft EIS/EIR and the Final EIS/EIR, it is important to point out that the CEQA impacts for mitigated peak daily emissions result in emission reduction from the CEQA Baseline and remain insignificant for all pollutants.

NEPA Impact Determination

NEPA impacts were calculated by subtracting the NEPA Baseline emissions (Table 3.2-13) from the unmitigated Project operational emissions for each analysis year (Table 3.2-18). The results, which are presented in the "Net Change from NEPA Baseline" rows in Table 3.2-18, show that during each Project year, the net change in daily operational emissions between the unmitigated Project and NEPA Baseline would exceed the following SCAQMD daily emission significance thresholds: (1) NO_X for all Project years; (2) VOC in all years except 2015; and (3) SO_2, PM_{10}, and $PM_{2.5}$ in 2010. These exceedances would occur, as the NEPA Baseline scenario includes all applicable CAAP measures and it would result in substantially lower source emission rates compared to the unmitigated Project or the CEQA Baseline.

The net changes from the NEPA Baselines for the unmitigated annual average daily Project operational emissions identified in the Final EIS/EIR (Table 3.2-18) are greater than those identified in the Draft EIS/EIR (Table 3.2-16) due to the changes described above at the beginning of **Impact AQ-3**.

NEPA impacts for peak daily emissions were calculated by subtracting the annual average daily NEPA Baseline emissions (Table 3.2-13) from the unmitigated peak daily Project operational emissions for each analysis year in Table 3.2-19. These results, which are presented in the "Net Change from NEPA Baseline" rows in Table 3.2-19, show that in all future years, the net change in peak daily operational emissions between the unmitigated Project and NEPA Baseline would exceed the SCAQMD daily thresholds for VOC, CO, NO_x, and $PM_{2.5}$ in all Project years. Additionally, the net change in emissions between these two scenarios would exceed the SCAQMD daily PM_{10} threshold in 2010.

The net changes from the NEPA Baselines for the unmitigated peak daily Project operational emissions identified in the Final EIS/EIR (Table 3.2-19) are greater than in those identified in the Draft EIS/EIR (Table 3.2-17) due to the changes described above at the beginning of **Impact AQ-3**.

Mitigation Measures

The mitigation measures discussed above would reduce emissions from unmitigated levels. The emission reductions associated with these mitigation measures are shown in Tables 3.2-20 (average daily emissions) and 3.2-21 (peak daily emissions).

The changes in the NEPA increment values for average daily and peak daily emissions identified in the Draft EIS/EIR (Table 3.2-18 and 3.2-19, respectively) to the Final EIS/EIR (Table 3.2-20 and 3.2-21, respectively) are to a large extent due to the revisions to operational data and the changes described above at the beginning of **Impact AQ-3**.

Significance of Impacts after Mitigation

Table 3.2-21 shows that in all future years, the net change in peak daily operational emissions between the mitigated Project and NEPA Baseline would exceed the SCAQMD daily significance thresholds for VOC, CO, NO_x, and $PM_{2.5}$. As a result, the mitigated Project would produce significant daily emissions of these pollutants during a peak day of activity under NEPA.

A comparison of the NEPA increments for the mitigated annual average daily operational emissions in the Final EIS/EIR (Tables 3.2-20) and the Draft EIS/EIR (Tables 3.2-18) are shown in Table 3.2-60. The differences in the net change in average daily operational emissions between the mitigated Project and NEPA Baseline between the Draft EIS/EIR and Final EIS/EIR include that VOC emissions in 2015 and CO emissions in 2020 and 2030 changed from being significant in Draft EIS/EIR to being insignificant in the Final EIS/EIR.

A comparison of the NEPA increments for the mitigated peak daily operational emissions presented in the Final EIS/EIR (Tables 3.2-21) and the Draft EIS/EIR (Tables 3.2-19) are shown in Table 3.2-60 at the end of Section 3.2. The differences in the net change in peak daily operational emissions between the mitigated Project and NEPA Baseline between the Draft EIS/EIR and Final EIS/EIR include that SO_X emissions in all years went from being significant in Draft EIS/EIR to being insignificant in the Final EIS/EIR, mainly due to implementation of low sulfur fuel mitigation measures.

The largest net change in peak daily operational emissions between the mitigated Project and NEPA Baseline is 543 lbs per day of NO_x, which occurs in 2010. The emission increases for the other criteria pollutants for all years are less than those for NO_x for 2010.

Impact AQ-4: Proposed Project operations would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate ambient offsite impacts of the proposed Project operational emissions. The analysis focused on year 2010, representing the time period when the proposed Project would generate the highest amount of emissions within and adjacent to the Middle Harbor container terminal (i.e., associated with ship docking and hoteling, terminal equipment, on-road trucks, and trains), which would produce the highest ambient impacts in the Port and onshore regions for any Project year. Appendix A-2 includes a discussion of the Project operational emissions dispersion modeling analysis.

<u>CEQA Impact Determination</u>

Table 3.2-22 presents the projected maximum ambient offsite impacts for unmitigated Project operations. These data show that the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient significance thresholds. As a result, unmitigated emissions from proposed Project operations would contribute to significant levels of one-hour and annual NO_2 under CEQA. All other pollutant impacts would remain below significance levels.

The changes in unmitigated ambient operational impacts from the Draft EIS/EIR (Table 3.2-20) to the Final EIS/EIR (Table 3.2-22) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Mitigation Measures

Implementation of **Mitigation Measures AQ-4 through AQ-8** would reduce the ambient impact of Project operational emissions from unmitigated levels. Table 3.2-22 presents the projected maximum ambient offsite impacts for mitigated Project operations. These data show that with mitigations, the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient thresholds. Although not quantified in this analysis, **Mitigation Measures AQ-7a, AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions and their ambient impacts from proposed operations in future years. Some of these control measure would get implemented after 2010, the peak year for emissions.

No additional feasible measures are available for consideration at this time.

The changes in mitigated ambient operational impacts from the Draft EIS/EIR (Table 3.2-21) to the Final EIS/EIR (Table 3.2-23) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Significance of Impacts after Mitigation

Ambient one-hour and annual NO_2 impacts from mitigated Project operations would remain significant under CEQA. However, these impacts would be less than the ambient NO_2 impacts produced from existing terminal operations in 2005.

<u>NEPA Impact Determination</u>

Table 3.2-22 shows that the maximum total NO_2 impacts for unmitigated Project operations would exceed the one-hour and annual SCAQMD significance thresholds. As a result, unmitigated emissions from proposed Project operations would contribute to significant levels of one-hour and annual NO_2 under NEPA. All other pollutant impacts would remain below significant levels.

The changes in unmitigated ambient operational impacts from the Draft EIS/EIR (Table 3.2-20) to the Final EIS/EIR (Table 3.2-22) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Mitigation Measures

Table 3.2-23 shows that implementation of **Mitigation Measures AQ-4 through AQ-8** (**Mitigation Measure AQ-7a** was not evaluated as it would be implemented after 2010) would result in ambient impacts from mitigated Project operations that would exceed the one-hour and annual SCAQMD ambient NO_2 thresholds. **Mitigation Measures AQ-7a, AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions from proposed operations in future years. Many of these control measures would get implemented after 2010, the peak emissions year.

The changes in mitigated ambient operational impacts from the Draft EIS/EIR (Table 3.2-21) to the Final EIS/EIR (Table 3.2-23) are attributed to updated background pollutant concentrations based on the most recently available regulatory monitoring data.

Significance of Impacts after Mitigation

Ambient one-hour and annual NO_2 impacts from mitigated Project operations would remain significant under NEPA. However, these impacts would be less than the ambient NO2 impacts produced from existing terminal operations in 2005.

Impact AQ-5: The proposed Project would not create objectionable odors to sensitive receptors.

Project operational activities would generate air pollutants from the combustion of diesel fuels. Some individuals may sense that diesel combustion emissions (mainly VOC and PM) are objectionable in nature, although quantifying the odorous impacts of these emissions to the public is difficult.

<u>CEQA Impact Determination</u>

The data in Tables 3.2-18 and 3.2-19 show that in all future years, unmitigated proposed Project operations would produce lower diesel combustion products and associated odors compared to CEQA Baseline levels. As a result, unmitigated Project operations would produce less than significant odor impacts under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11, AQ-25, and AQ-26** would further reduce Project emissions and their associated odor impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

The data in Tables 3.2-18 and 3.2-19 show that in all future years, unmitigated proposed Project operations would produce more diesel combustion products and resulting odors compared to NEPA Baseline levels. Given that the distance between proposed Project emission sources within the terminal and the nearest residents is at least 0.4 miles, this distance would be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels. As a result, proposed Project operations would produce less than significant odor impacts under NEPA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11, AQ-25, and AQ-26** would further reduce Project emissions and their associated odor impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

Impact AQ-6: The proposed Project would expose receptors to significant levels of TACs.

The following presents the results of a HRA that was conducted to quantify the significance of public health effects generated by Project construction and operational emissions of TACs. The HRA evaluated individual lifetime cancer risks, cancer burden, and chronic and acute non-cancer hazard indices associated with the proposed Project.

Individual lifetime cancer risk represents the chance that an individual would contract cancer after a lifetime (70 years) of exposure to the TACs of concern. The SCAQMD considers the cancer risk associated with a proposed project to be significant if it equals or exceeds 10 chances in one million (10×10^{-6}) at any residential receptor.

Cancer burden is an estimate of the number of persons that would contract cancer from exposure to Project TAC emissions within the Project's ZOI. The SCAQMD considers the cancer burden associated with a proposed project to be significant if it equals or exceeds 0.5.

The chronic and acute non-cancer hazard indices represent predicted long- and short-term exposures to certain TACs, respectively; calculated by dividing the model-predicted TAC concentration by the TAC reference exposure levels (RELs) established by OEHHA. An HHI equal to or greater than one indicates the potential for adverse health effects.

Estimates of Project health effects are based on the evaluation of operational emissions associated with the proposed Project. Appendix A-3 presents the Project HRA and the TAC emission calculations used for inputs in the HRA. Since the

Project would generate emissions of PM, this analysis also discusses the potential effects of these emissions in terms of increased mortality and morbidity in the region.

Significance of Project Health Impacts

Emissions of TACs from Project operational sources would occur from:

- Internal combustion of diesel or residual fuels in ships, tugboats, terminal equipment, locomotives, and trucks;
- External combustion of distillate or residual fuels in OGV service boilers; and
- Particulate emissions from truck tire and brake wear.

For the internal combustion sources, DPM exhaust emissions were modeled in the HRA for cancer and chronic non-cancer effects. With regard to acute non-cancer effects from these sources, the HRA assessed both criteria pollutants and chemicals that are subsets of VOCs and DPM. Although no specific risk factors have been developed for UFP, they are major constituents of DPM emissions resulting from transportation sources. DPM emissions are analyzed in the HRA and they include the entire range of diesel particulate sizes including UFP, and the risk factors established for DPM for use in health risk analysis incorporated all DPM constituents during the regulatory review process.

For the OGV service boilers, combustion VOC and PM_{10} emissions were speciated into their respective TAC components using profiles provided by the ARB (ARB 2002 and 2003). For truck tire and brake wear, fugitive PM_{10} emissions were also speciated into their respective TAC components using ARB profiles (ARB 2002).

For determining significance from a CEQA standpoint, the HRA calculated the incremental change in health effect values due to the proposed Project compared to CEQA Baseline conditions (i.e., proposed Project minus CEQA Baseline). For the determining significance from a NEPA standpoint, this HRA determined the incremental change in health effect values due to the proposed Project compared to NEPA Baseline conditions (i.e., proposed Project minus NEPA Baseline). These Project increments were compared to the health risk thresholds identified in Section 3.2.2.1 to determine their significance.

To estimate cancer risk impacts, Project operational emissions were projected over a 70-year period, from 2010 through 2079. This 70-year projection of emissions was done for each alternative and the NEPA and CEQA Baselines to enable appropriate calculation of cancer risk increments (the change in risk between the alternative and the NEPA and CEQA Baselines). The 70-year emissions were estimated from equipment activity levels and emission factors for each year from 2010 through 2079. Yearly equipment activity levels from 2010 through 2025 were interpolated from Project milestone years 2010, 2015, 2020, and 2030 for the proposed Project and NEPA Baseline.

The Project activity levels between 2010 and 2025 reflect the projected growth in throughput and the implementation of proposed environmental controls (such as VSRP and cold-ironing) discussed in Section 3.2.2.2. Activity levels from 2025 through 2079 were held constant at 2025 levels, as estimates of Project throughput projections do not extend beyond this date and it is assumed that after 2025 the terminal would remain at design capacity. For the CEQA Baseline, activity levels and emissions were held constant at their 2005 values for all years.

Cancer burden was determined with the approach used by ARB in the Hotspots Analysis and Reporting Program (HARP) program (ARB 2003a). To estimate cancer burden, the incremental cancer risk was determined for each census block located partially or completely within the Project's ZOI, which is defined as the area within the isopleth representing a one in one million (1×10^{-6}) cancer risk increment, in accordance with SCAQMD risk assessment procedures (SCAQMD 2005b). The cancer risk increment for each census block was then multiplied by the census block residential population, and the products were summed for all census blocks to create the total cancer burden value.

To estimate Project non-cancer chronic and acute health effects, the HRA focused on Project operations in year 2010, as this was determined, based on annual emissions and their locations, to represent the year with the greatest incremental impacts between the Project and baseline conditions. The CEQA Baseline was modeled using 2005 emissions (as the baseline year) and the NEPA Baseline was modeled with 2010 emissions to match the same period of operation as the proposed Project.

The HRA estimated cancer and non-cancer effects to several population subgroups (receptors), including residential, offsite occupational, and sensitive receptors. Each of these receptor types has specific air pollutant exposure duration and breathing rate factors, as presented in Appendix A-3. Cancer burden was calculated using residential exposure assumptions. The analysis followed OEHHA guidance (OEHHA 2003).

Table 3.2-24 presents estimates of maximum incremental cancer risks, chronic and acute HHI increments, and the incremental cancer burden associated with the proposed Project. The values presented for each receptor type correspond to the receptor location with the maximum increment. These are the values on which the impact determinations were made. The cancer risk and non-cancer HHI increments at all other receptors within the modeling domain would be less than those shown in Table 3.2-24.

The changes in unmitigated health risk impacts from the Draft EIS/EIR (Table 3.2-22) to the Final EIS/EIR (Table 3.2-24) are attributed to a reduction in emissions of toxic air contaminants resulting mainly from new control and mitigation measures including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020. Therefore, starting in 2020 all RTG emissions go to zero in the Final EIS/EIR health risk assessment accounting for the decreases in risk increments.

Section 7.0 of Appendix A-3 explains the methodology used for identifying the locations of maximum risk increments for the three types of receptors (i.e., resident, worker, and sensitive) analyzed and why the risk numbers for the Project and the NEPA and CEQA baselines are not constant. As previously mentioned, the focus of the HRA in this EIS/EIR is identification of the maximum incremental impact of an alternative, which is the difference between an alternative impact and a baseline impact. Since the emission source locations and their intensity (i.e., their corresponding emissions) vary substantially between the NEPA and CEQA baselines, it is expected that the locations of maximum NEPA and CEQA incremental impacts would differ when the risks for each Project alternative are compared to the two baselines. Consequently, the locations of the maximum NEPA and CEQA incremental impacts would differ from each other and the associated risks for the Project would also differ at those different locations.

Figures 3.2-2 through 3.2-6 show the distribution of predicted residential cancer risks within the modeling domain for the following scenarios:

- CEQA Baseline;
- NEPA Baseline;
- Unmitigated proposed Project;
- Unmitigated CEQA increment (unmitigated Project minus CEQA Baseline); and
- Unmitigated NEPA increment (unmitigated Project minus NEPA Baseline).

Emission reductions in the NEPA Baseline and the Unmitigated Proposed Project modeling scenarios from the Draft EIS/EIR to the Final EIS/EIR account for noticeable changes in the residential cancer risk contour plots for the NEPA Baseline, Unmitigated Proposed Project, Unmitigated Project-CEQA increment and Unmitigated Project-NEPA increment scenarios.

The decrease in Final EIS/EIR emissions for the NEPA Baseline scenario creates noticeable changes in the shape and area of the residential cancer risk isopleths in Figure 3.2-3. While the 50 and 100 in a million cancer risk isopleths around the facility show small reductions in area and little change in shape, there is a noticeable decrease in the area of the 10 and 20 isopleths in the communities of Wilmington and Long Beach. The changes in the NEPA Baseline health risk isopleths are attributed to the reduction of TAC emissions from new control and mitigation measures described above.

The decrease in the Final EIS/EIR emissions from the unmitigated Project scenario also creates noticeable changes in the shape and area of the residential cancer risk isopleths in Figure 3.2-4. The emission reductions create slight decreases in the area (and shape) of the 50 and 100 in a million cancer risk contours, in addition to a significant reduction in the area of the 10 and 20 in a million isopleths in the communities of San Pedro, Wilmington, and Long Beach. The changes in the unmitigated Project residential cancer risk isopleths are attributed to the reduction of TAC emissions from new control and mitigation measures described above.

While there are no emission changes from the Draft EIS/EIR to the Final EIS/EIR for the CEQA Baseline, emission reductions in the unmitigated Project scenario create differences in the unmitigated Project minus CEQA increment contour plot (Figure 3.2-5). The reduction in emissions in the unmitigated Project scenario creates lower CEQA increment values throughout the study boundary, most noticeable with the elimination of the -10 in a million cancer risk contour and the extension of the -20 contour into the San Pedro, Wilmington and Long Beach communities. The changes in the unmitigated Project-CEQA increment contour plot is primarily attributed to the reduction in TAC emissions from new control and mitigation measures described above.

The emission reductions in the Final EIS/EIR account for a significant reduction in the unmitigated Project minus NEPA increment (Figure 3.2-6) with the 10 and 20 in a million cancer risk contours shrinking considerably in comparison to Figure 3.2-6 in the Draft EIS/EIR. The changes in the unmitigated Project minus NEPA Baseline increment contour plots are primarily attributed to the reduction in TAC emissions from new control and mitigation measures including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020.

CEQA Impact Determination

Table 3.2-24 shows that the maximum CEQA increment for residential cancer risk from the unmitigated Project is predicted to be negative five in one million (-5×10^{-6}). This risk value is less than the significance criterion of 10 in one million (10×10^{-6}) risk, and therefore would produce a less than significant impact under CEQA. This risk level would occur at residences on the corner of Skyline Drive and East Panorama Drive, approximately one mile south of Interstate 405. The main contributors to this cancer risk value are ships and trucks. Figure 3.2-5 shows that the unmitigated Project would produce lower cancer risks to all but the most distant regions of the Project region, compared to the CEQA Baseline.

The maximum CEQA increment for occupational cancer risk from the unmitigated Project is predicted to be negative two in one million (-2×10^{-6}). This risk value is less than the significance criterion of 10 in one million cancer risk, and therefore would produce a less than significant impact under CEQA. This risk level would occur in the southwest portion of the POLA. The main contributors to this cancer risk value are ships and trucks.

The maximum CEQA increment for cancer risk at a sensitive receptor from the unmitigated Project is predicted to be negative two in one million (-2×10^{-6}). This risk value, which was conservatively modeled with 70-year residential exposure assumptions, is less than the significance criterion of 10 in one million cancer risk, and therefore would produce a less than significant impact under CEQA. This risk level would occur at the Cleveland Elementary School at 4760 Hackett Avenue in Lakewood.

While there are no changes in emissions from the Draft EIS/EIR to the Final EIS/EIR for the CEQA Baseline, emission reductions in the unmitigated Project scenario create differences in the unmitigated Project minus CEQA Baseline increments (Table 3.2-24). Changes in the unmitigated Project minus CEQA Baseline increments are primarily attributed to the reduction in TAC emissions from new control and mitigation measures, including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020. These emission reductions result in lower overall residential health risk impacts for the unmitigated Project, which subsequently result in lower unmitigated Project minus CEQA Baseline increment values.

Table 3.2-24 shows that the maximum CEQA increments for the chronic and acute HHIs from the unmitigated Project would be less than one for all receptor locations. Therefore, the non-cancer chronic and acute health effects associated with the unmitigated Project would produce less than significant impacts under CEQA.

There are no significant changes in non-cancer chronic and acute emissions from the Draft EIS/EIR to the Final EIS/EIR, therefore the non-cancer chronic and acute health effects associated with the unmitigated Project remain unchanged, and would be less than significant under CEQA.

Mitigation Measures

As health impacts under CEQA would be less than significant, no mitigation is required. However, this HRA also presents an evaluation of how **Mitigation Measures AQ-4 through AQ-8** would reduce cancer risks from the Project. Although not quantified in this analysis, implementation of **Mitigation Measures AQ-9** through **AQ-11, AQ-25, and AQ-26** also would reduce Project emissions and associated health impacts.

Significance of Impacts after Mitigation

Table 3.2-25 shows that the maximum CEQA increments for cancer risk from the mitigated Project would be equal to or lower than those estimated for the unmitigated Project (Table 3.2-24) for all receptor types. The mitigated Project would produce lower cancer risks in comparison to the CEQA Baseline within the Project region.

The changes in mitigated health risk impacts from the Draft EIS/EIR (Table 3.2-23) to the Final EIS/EIR (Table 3.2-25) are attributed to the same reduction in TAC emissions from new control and mitigation measures described in the unmitigated Project scenario.

Figure 3.2-2. Residential Cancer Risk Estimates for CEQA Baseline (Probability of Causing Cancer in a Million)

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Figure 3.2-3 Residential Cancer Risk Estimates for NEPA Baseline (Probability of Causing Cancer in a Million)

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Figure 3.2-4 Residential Cancer Risk Estimates for Unmitigated Project (Probability of Causing Cancer in a Million)

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Figure 3.2-5 Residential Cancer Risk Estimates for the Unmitigated CEQA Increment – Unmitigated Project minus CEQA Baseline (Probability of Causing Cancer in a Million)

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Figure 3.2-6 Residential Cancer Risk Estimates for the Unmitigated NEPA Increment – Unmitigated Project minus NEPA Baseline (Probability of Causing Cancer in a Million)

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While there are no changes in CEQA Baseline emissions from the Draft EIS/EIR to the Final EIS/EIR, TAC emission reductions in the mitigated Project scenario create differences in the mitigated Project minus CEQA Baseline increment values (Table 3.2-25). Changes in the mitigated Project minus CEQA Baseline increments are primarily attributed to the same reduction in TAC emissions from new control and mitigation measures describes in the unmitigated Project scenario. These emission reductions result in lower overall residential health risk impacts for the mitigated Project, which subsequently result in lower mitigated Project-CEQA increment values.

<u>NEPA Impact Determination</u>

Table 3.2-24 shows that the maximum NEPA increment for residential cancer risk for the unmitigated Project is predicted to be nine in one million (9×10^{-6}). This risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur in a mixed-use area in downtown Long Beach, north of Ocean Boulevard and east of Golden Shore Street.

As shown in Table 3.2-24, the maximum NEPA increment for occupational cancer risk from the unmitigated Project is predicted to be 16 in one million (16×10^{-6}). This risk value exceeds the significance criterion of 10 in a million (10×10^{-6}) risk, and would be a significant impact under NEPA. This risk level would occur in the industrial area on Terminal Island at the southeastern corner of Pier A.

As shown in Table 3.2-24, the maximum NEPA increment for cancer risk at a sensitive receptor from the unmitigated Project is predicted to be seven in one million (7×10^{-6}). This cancer risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur at a day care center located near Chavez Elementary School at 730 West Third Street in downtown Long Beach.

- Table 3.2-24 also shows that the maximum NEPA increments for the chronic and acute hazard indices from the unmitigated Project would be less than one at all receptor locations. Therefore, the non-cancer chronic and acute health effects associated with the unmitigated Project would produce less than significant impacts under NEPA.

A decrease from the Draft EIS/EIR to the Final EIS/EIR in emissions in both the NEPA Baseline and the unmitigated Project modeling scenarios account for the reduction in residential cancer risk increments for the NEPA Baseline. The emission reductions in the Final EIS/EIR account for the reductions in the unmitigated Project minus NEPA Baseline increment illustrated in Table 3.2-24. The changes in the unmitigated Project and NEPA Baseline increments are primarily attributed to the reduction in TAC emissions from new control and mitigation measures including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020.

There are no significant changes in non-cancer chronic and acute emissions from the Draft EIS/EIR to the Final EIS/EIR, therefore the non-cancer chronic and acute health effects associated with the unmitigated Project remain unchanged, and would be less than significant under NEPA.

Mitigation Measures

The HRA evaluated how **Mitigation Measures AQ-4 through AQ-8** would reduce Project cancer risks under NEPA. Although not quantified in this Draft EIS/EIR, implementation of **Mitigation Measures AQ-9 through AQ-11, AQ-25, and AQ-26** also would reduce Project emissions.

Significance of Impacts after Mitigation

Table 3.2-25 shows that the maximum NEPA increment for residential cancer risk for the mitigated Project is predicted to be eight in one million (8×10^{-6}). This cancer risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur in a mixed-use area in downtown Long Beach, north of Ocean Boulevard and east of Golden Shore Street.

The maximum NEPA increment for occupational cancer risk from the mitigated Project is predicted to be nine in one million (9×10^{-6}). This is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur in the industrial area on Terminal Island at the south eastern corner of Pier A.

The maximum NEPA increment for cancer risk at a sensitive receptor is predicted to be four in a million (4×10^{-6}). This cancer risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur at a day care center located near Chavez Elementary School at 730 West Third Street in downtown Long Beach.

A decrease in emissions in both the NEPA Baseline and Mitigated Proposed Project modeling scenarios from the Draft EIS/EIR to the Final EIS/EIR account for the reduction in residential cancer risk increments for the NEPA Baseline. The emission reductions in the Final EIS/EIR account for the reductions in the mitigated Project minus NEPA Baseline increment illustrated in Table 3.2-25. Changes in the mitigated Project minus NEPA Baseline increments are primarily attributed to the same reduction in TAC emissions from new control and mitigation measures previously described in the unmitigated Project scenario.

Table 3.2-25 also shows that the maximum NEPA increments for all other health effects (cancer risk to sensitive receptors, and acute and chronic health hazard indices) associated with the mitigated Project would be less than significant under NEPA.

There are no changes in non-cancer chronic and acute emissions from the Draft EIS/EIR to the Final EIS/EIR, therefore the non-cancer chronic and acute health effects associated with the mitigated Project remain unchanged, and would be less than significant under NEPA.

Figures 3.2-7 through 3.2-9 show the distributions of predicted residential cancer risks within the modeling domain for the: (1) mitigated Project; (2) mitigated CEQA increment (mitigated Project minus CEQA Baseline); and (3) mitigated NEPA increment (mitigated Project minus NEPA Baseline), respectively.

Emission reductions in the mitigated Project scenario create differences in the contour plot of residential cancer risk estimates for the mitigated Project alternative (Figure 3.2-7). The Final EIS/EIR emission reductions create a slight decrease in the area of the 10, 20, and 50 in one million cancer risk contours in addition to a slight shift and reduction in the 20 in one million cancer risk contour near the northeast portion of Wilmington.

While there is no change to emission rates from the Draft EIS/EIR to the Final EIS/EIR for the CEQA Baseline, emission reductions in the mitigated Project scenario create differences in the mitigated Project minus CEQA Baseline increment contour plot (Figure 3.2-8). The reduction in emissions in the mitigated Project scenario creates lower CEQA increment values throughout the study boundary, most noticeably with the elimination of the -10 in one million cancer risk contour and the expansion of the -20 in one million cancer risk contour into the San Pedro, Wilmington, and Long Beach communities. The changes in the mitigated Project minus CEQA Baseline increment contour plot are attributed to the reduction in TAC emissions from new control and mitigation measures previously described.

The decrease in emissions in the mitigated Project modeling scenario from the Draft EIS/EIR to the Final EIS/EIR accounts for a noticeable change in the residential cancer risk estimate contour plots for the mitigated Project and mitigated minus NEPA increment. The emission reductions in the Final EIS/EIR account for a significant reduction in the mitigated Project-NEPA Baseline increment (Figure 3.2-9) with a shift in the overall contour shape towards the eastern portion of the property boundary and a reduction in the five and 10 in one million cancer risk contours in comparison to the Draft EIS/EIR. Changes associated with the mitigated Project minus NEPA Baseline increment contour plot are primarily attributed to the same reduction in TAC emissions from new control and mitigation measures described above.

PM Morbidity & Mortality Considerations

Particles small enough to be inhaled into the deepest parts of the lung are of great concern to public health. Respirable particles (PM_{10}) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis, and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM_{10} and $PM_{2.5}$.

The proposed Project would emit DPM, which is mainly $PM_{2.5}$, during Project construction and operation. This section discusses potential health effects caused by DPM emissions and the regulatory impetus to address their health impacts.

Health Effects of DPM Emissions

Epidemiological studies substantiate the correlation between inhalation of ambient PM and increased mortality and morbidity (ARB 2002a and 2007d). Recently, ARB conducted a study to assess the potential health effects associated with exposure to air pollutants arising from ports and goods movement in California (ARB 2006a and 2006b). ARB's assessment evaluated numerous studies and research efforts, and focused on PM and ozone as they represent a large portion of known risk associated with exposure to outdoor air pollution. ARB's analysis of various studies allowed large-scale quantification of the health

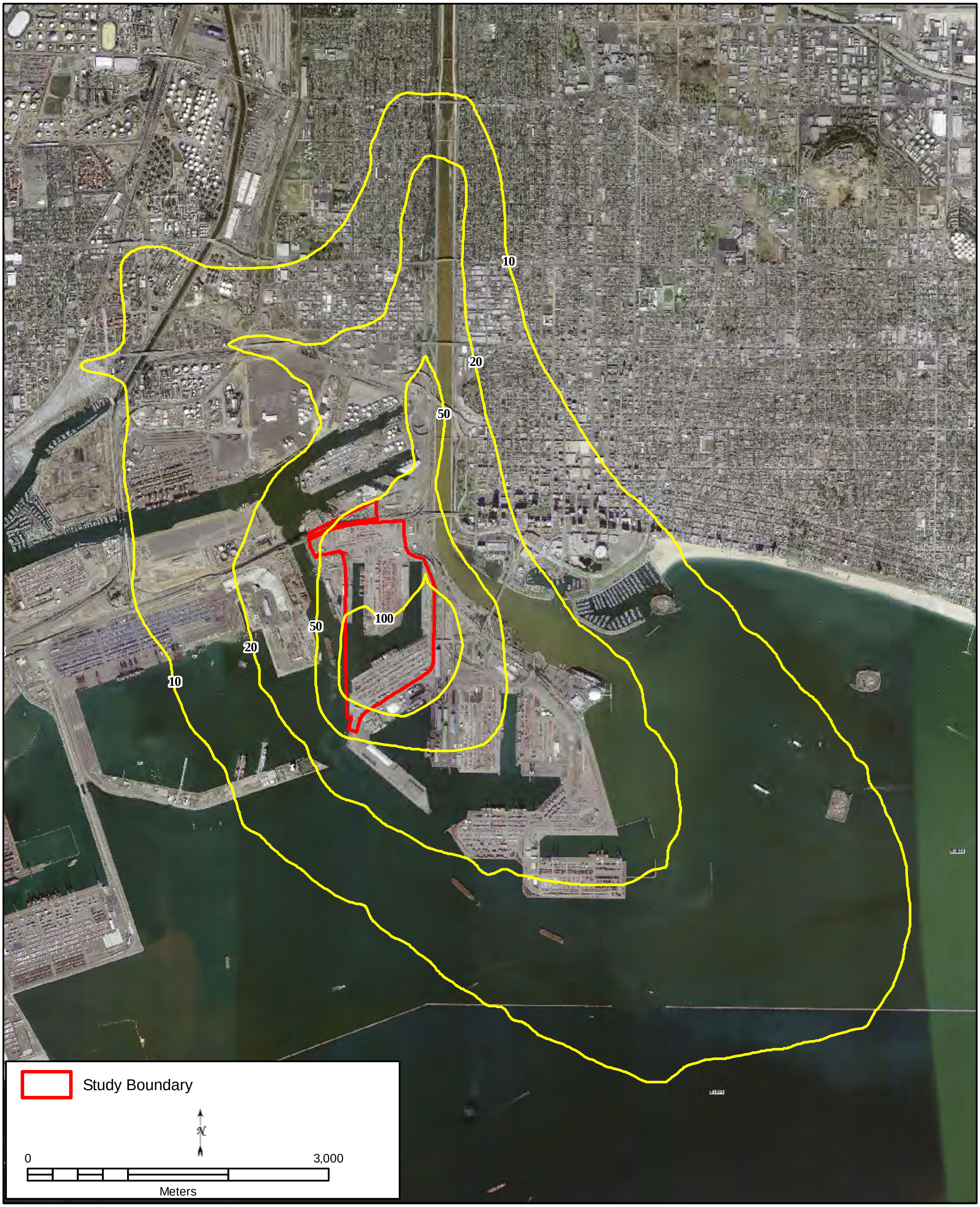

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Figure 3.2-7 Residential Cancer Risk Estimates for Mitigated Project (Probability of Causing Cancer in a Million)

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Figure 3.2-8 Residential Cancer Risk Estimates for the Mitigated CEQA Increment – Mitigated Project minus CEQA Baseline (Probability of Causing Cancer in a Million)

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Figure 3.2-9 Residential Cancer Risk Estimates for the Mitigated NEPA Increment – Mitigated Project minus NEPA Baseline (Probability of Causing Cancer in a Million)

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effects associated with emission sources. These studies quantified premature deaths and increased cases of disease linked to exposure to PM and ozone from ports and goods movement. Table 3.2-26 presents the statewide PM and ozone health effects identified by the ARB (ARB 2006h).

In addition, although epidemiologic studies are numerous, few toxicology studies have investigated the responses of human subjects specifically exposed to DPM, and the available epidemiologic studies have not measured the DPM content of the outdoor pollution mix. ARB has made quantitative estimates of the public health impacts of DPM based on the assumption that DPM is as toxic as the general ambient PM mixture (ARB 2006b). The ARB study concluded that there are significant uncertainties involved in quantitatively estimating the health effects of exposure to outdoor air pollution. Uncertain elements include emission and population exposure estimates, concentration-response functions, baseline rates of mortality and morbidity that are entered into concentration response functions, and occurrence of additional not-quantified adverse health effects (ARB 2006). Many of these elements have uncertainty values of up to plus or minus 200 percent. Numerous new studies, ongoing and proposed, will likely increase scientific knowledge and provide better estimates of DPM health effects.

It should be noted that PM in ambient air is a complex mixture that varies in size and chemical composition, as well as varying spatially and temporally. Different types of particles may cause different effects with different time courses, and perhaps only in susceptible individuals. The interaction between PM and gaseous co-pollutants adds additional complexity because in ambient air pollution, a number of pollutants tend to co-occur and have strong inter-relationships with each other (e.g., PM, SO_2, NO_2, CO, and O_3) (SCAQMD 2007; ARB 2006h; and ARB 2006i).

Nevertheless, various studies have been published that substantiate the correlation between the inhalation of ambient PM and increased cases of premature death from heart and/or lung diseases (Pope et al. 1995 and 2002; Jerrett et al. 2005; Krewski et al. 2001). Studies such as these serve as foundations for PM air quality standards promulgated by SCAQMD, ARB, EPA, and the World Health Organization.

Existing CEQA Thresholds

Concentration Thresholds

Regulatory agencies set protective health-based short and long-term ambient concentration standards designed "in consideration of public health, safety, and welfare, including, but not limited to, health, illness, irritation to the senses, aesthetic value, interference with visibility, and effects on the economy" (Health and Safety Code Section 39606(a)(2)). Ambient Air Quality Standards (AAQS) specify concentrations and durations of exposure to air pollutants that reflect the relationships between the intensity and composition of air pollution and undesirable effects. The fundamental objective of an AAQS is to provide a basis for preventing or abating adverse health or welfare effects of air pollution.

In developing the AAQS, state and local air quality regulatory agencies consider existing health science literature and recommendations from OEHHA. Standards are set to ensure that sensitive population sub-groups are protected from exposure to levels of pollutants that may cause adverse health effects. In the case of PM, CAAQS are peer reviewed by the Air Quality Advisory Committee (AQAC), an external scientific peer review committee, comprised of world-class scientists in the PM field.

Within the SCAB, the SCAQMD further identifies localized ambient significance thresholds. These ambient concentration thresholds target those pollutants the SCAQMD has determined are most likely to cause or contribute to an exceedance of the NAAQS or CAAQS. The localized standards for PM are more stringent than either the NAAQS or the CAAQS. SCAQMD's localized significance thresholds for PM_{10} and $PM_{2.5}$ are 10.4 $\mu g/m^3$ and 2.5 $\mu g/m^3$ for construction and operation, respectively. These values were developed based on ARB guidance and epidemiological studies showing significant toxicity (resulting in mortality and morbidity) related to exposure to fine particles. This EIS/EIR conducted dispersion analyses to determine the significance of ambient impacts of PM_{10} and $PM_{2.5}$ from proposed activities in **Impacts AQ-2 and AQ-4**.

Emission Thresholds

The SCAQMD establishes mass emission thresholds to evaluate the significance of proposed construction and operational activities that emit PM within the SCAB. These thresholds are defined in units of pounds per day. Projects that exceed these thresholds may have a significant adverse regional effect on PM levels. Other forms of mass emission thresholds include annual de minimis thresholds used in the conformity applicability analyses as part of the EPA General Conformity Regulations. Analyses for the Project quantified mass daily emissions and determined significance as described in Section 3.2.2.3. This EIS/EIR quantified proposed emissions and compared them to the SCAQMD PM_{10} and $PM_{2.5}$ emission thresholds in **Impacts AQ-1 and AQ-3**.

HRA Thresholds

SCAQMD specifies thresholds for cancer risk and non-cancer chronic and acute hazard impacts. The cancer risk calculation methodology accounts for the cancer potency of a pollutant and the expected dose for exposure pathways. For chronic non-cancer and acute exposures, maximum annual concentrations and peak daily concentrations, respectively, are compared with the OEHHA Recommended Exposure Limit (REL), which are used as indicators of potential adverse non-cancer health effects. The RELs are concentrations, at or below which no adverse health effects are anticipated in the general human population and are based on the most sensitive relevant adverse health effect reported in the medical and toxicological literature. RELs are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety.

Risk assessment and health impact determination methodologies rely on risk assessment health values published by OEHHA, which in turn are based on results of numerous toxicology and epidemiology studies. For DPM, OEHHA has established health values for cancer and non-cancer chronic effects to be used in quantification of health impacts. The Project HRA quantified both cancer risk and non-cancer chronic impacts from DPM exposure, per OEHHA risk assessment methodology.

In addition, the Port has adopted SCAQMD's CEQA threshold of 10 in one million excess cancer risk; and an acute or chronic HHI of 1.0 in evaluating new projects (see discussion under **Impact AQ-6**). The thresholds set by EPA, ARB, and SCAQMD for localized, regional and toxic impacts are designed to account for health impacts, such as premature deaths, cardiac and respiratory hospitalizations, asthma, lost work/school days. By evaluating proposed emissions with these criteria, this EIS/EIR has indirectly quantified these adverse effects.

Quantifying Morbidity and Mortality

ARB's recent study (ARB 2006h and ARB 2006i) used a health effects model, based on multiple epidemiological studies, which quantified expected non-cancer impacts of mortality and morbidity from ambient PM exposure (for example premature deaths, cardiac and respiratory hospitalizations, asthma and other lower respiratory symptoms, and lost work/school days). The study focused on large-scale applications such as the benefits of attaining the state air quality standard for $PM_{2.5}$, the impacts of goods movement emissions on a statewide and broad regional level, and the impacts from combined operations at the POLB and POLA (ARB 2006h and ARB 2006i).

According to recent ARB guidance, health impacts from PM exposure are best estimated at the statewide level or a large geographic scale because these estimates are based on epidemiological studies that relied on single ambient air monitoring stations to represent regional exposures to the pollutant and incidence rates obtained at the county level (ARB 2008c). Because ARB's methodology was designed for larger-scale processes affecting a much larger population, the methodology may not be sensitive enough to provide accurate results for projects affecting much smaller populations.

The proposed Project is located in Long Beach and, based on the HRA completed for this Project, the potential health impacts of PM emissions would largely be restricted to an area three miles east-west by three miles north-south around the terminal area (about 87,000 people). In contrast, ARB's study looked at a 40 mile by 50 mile area that encompasses much of the population of the SCAB.

Although there are significant uncertainties in the morbidity and mortality calculations, a sample analysis was conducted using OEHHA guidance and the results of the unmitigated and mitigated Project annual PM_{10} concentrations. Details of the analysis are presented in Appendix A-3.

The ARB published a recent document that updates the health information and methodology that relates changes in $PM_{2.5}$ exposures to premature death (ARB 2008c). OEHHA is in the process of developing further guidance on assessing health impacts from PM exposure. The approach for this analysis followed this recent ARB guidance and earlier guidance for projects similar in size to the Middle Harbor Redevelopment Project including the "Public Hearing to Consider

Amendments to Ambient Air Quality Standards for Particulate Matter and Sulfates" (ARB 2002b).

The change in annual PM_{10} concentrations in the neighborhoods most exposed to the potential Project is estimated to be 0.15 µg/m^3 with mitigation and 0.17 µg/m^3 without mitigation. In both cases, the Project would result in an increase in mortality of approximately 0.006 additional cases per year. Given the large uncertainties in the results, the conclusion is that there would be no expected increase in mortality and morbidity due to the Project.

Uncertainty of Risk Analysis

Risk estimates, by their nature, cannot be completely accurate because they are *predictions* of risk. Scientists, medical experts, regulators, and practitioners do not completely understand how toxic air pollutants harm human cells and how different pollutants may interact with each other in the human body. The exposure assessment often relies on computer models that are based on numerous assumptions, both in terms of present and future conditions.

When information is missing or uncertain, risk analysts generally make assumptions that tend to prevent them from underestimating the potential risk. These assumptions generally are very conservative so they provide a margin of safety to protect human health. For example, regarding exposure durations for cancer risks, essentially no one resides in one location 24 hours a day and 350 days a year for 70 years. Additionally, there is no one standard way of conducting health risk assessments, leading to possible problems in comparing different risks. Assumptions also change over time and even HRAs completed using the same models can produce different results.

OEHHA provided the following discussion of risk assessment uncertainties (OEHHA 2003).

> *There is a great deal of uncertainty associated with the process of risk assessment. The uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in these guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. Sources of uncertainty, which may either overestimate or underestimate risk, include: 1) extrapolation of toxicity data in animals to humans; 2) uncertainty in the estimation of emissions; 3) uncertainty in the air dispersion models; and 4) uncertainty in the exposure estimates. Uncertainty may be defined as what is not known and may be reduced with further scientific studies. In addition to uncertainty, there is a natural range or variability in the human population in such properties as height, weight, and susceptibility to chemical toxicants. Scientific studies with representative individuals and large enough sample size can characterize this variability.*
>
> *Interactive effects of exposure to more than one carcinogen or toxicant are also not necessarily quantified in the HRA. Cancer risks from all emitted carcinogens are typically added, and hazard quotients for substances impacting the same target organ system are added to determine the HHI. Many examples of additivity and synergism (interactive effects greater than additive) are known. For substances that act synergistically, the HRA could underestimate the risks. Some substances may have antagonistic effects (lessen the toxic effects produced by another substance). For substances that act antagonistically, the HRA could overestimate the risks.*
>
> *Other sources of uncertainty, which may underestimate or overestimate risk, can be found in exposure estimates where little or no data are available (e.g., soil half-life and dermal penetration of some substances from a soil matrix).*
>
> *The differences among species and within human populations usually cannot be easily quantified and incorporated into risk assessments. Factors including metabolism, target site sensitivity, diet, immunological responses, and genetics may influence the response to toxicants. The human population is much more diverse both genetically and culturally (e.g., lifestyle, diet) than inbred experimental animals. The intraspecies variability among humans is expected to be much greater than in laboratory animals. Adjustment for tumors at multiple sites induced by some carcinogens could result in a higher potency. Other uncertainties arise 1) in the assumptions underlying the dose-response model used, and 2) in extrapolating from large experimental doses, where, for example, other toxic effects may compromise the assessment of carcinogenic potential, to usually much smaller environmental doses. Also, only single tumor sites induced by a substance are usually considered. When epidemiological data are used to generate a carcinogenic potency, less uncertainty is involved in the extrapolation from workplace exposures to environmental*

exposures. However, children, a subpopulation whose hematological, nervous, endocrine, and immune systems, for example, are still developing and who may be more sensitive to the effects of carcinogens on their developing systems, are not included in the worker population and risk estimates based on occupational epidemiological data are more uncertain for children than adults. Finally, the quantification of each uncertainty applied in the estimate of cancer potency is itself uncertain.

Thus, risk estimates generated by an HRA should not be interpreted as the expected rates of disease in the exposed population but rather as estimates of potential risk, based on current knowledge and a number of assumptions. Additionally, the uncertainty factors integrated within the estimates of non-cancer RELs are meant to err on the side of public health protection in order to avoid underestimation of risk. Risk assessment is best used as a ruler to compare one source with another and to prioritize concerns.

Impact AQ-7: The proposed Project would not conflict with or obstruct implementation of the applicable AQMP.

Operation of the Project would produce emissions of nonattainment pollutants primarily from diesel-powered sources. The 2007 AQMP proposes emission reduction measures that are designed to bring the SCAB into attainment of the national and state ambient air quality standards. The attainment strategies in this plan include mobile source control measures and clean fuel programs that are enforced at the federal and state level on engine manufacturers and petroleum refiners and retailers. As a result, Project operations would need to comply with these control measures. The SCAQMD also adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. The proposed Project would comply with these regulatory requirements which are designed to implement the AQMP. Thus, the proposed Project would comply with the 2007 AQMP emission reduction measures that are designed to bring the SCAB into attainment of the national and state ambient air quality standards. It would not conflict with or obstruct implementation of the SIP.

The POLB provides SCAG with Port-wide cargo forecasts that are used to simulate growth scenarios in the AQMP, and the attainment demonstrations in the AQMP include emissions estimated for future growth at the Port (SCAG 2009) Since the 2007 AQMP assumes growth associated with the proposed Project, it would not exceed the future growth projections in the 2007 AQMP and it would neither conflict with nor obstruct implementation of the SIP. Moreover, because one objective of the AQMP is to improve the flow of goods at the Ports, the proposed Project and the associated control measures work in concert with implementation of the 2007 AQMP. Furthermore, adoption of existing regulations and CAAP measures would reduce proposed Project emissions in comparison to the CEQA Baseline (Table 3.2-18). As a result, the Project would promote the objectives of the 2007 AQMP.

<u>CEQA Impact Determination</u>

The Project would not conflict with or obstruct implementation of the 2007 AQMP. Therefore, impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11** would further reduce Project emissions and associated air quality impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

The Project would not conflict with or obstruct implementation of the AQMP. Therefore, impacts would be less than significant under NEPA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11** would reduce Project emissions and associated air quality impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

Impact AQ-8: The proposed Project would produce GHG emissions that would exceed the CEQA threshold.

Climate change, as it relates to man-made GHG emissions, is by nature a global impact. An individual project does not generate by itself enough GHG emissions to significantly influence global climate change (AEP 2007). Thus, the issue of global climate change is a cumulative impact, such that an appreciable impact on global climate change would only occur when GHG emissions from a project combine with GHG emissions from other man-made activities on a global scale. Nevertheless, for the purposes of this EIS/EIR, the POLB has chosen to assess GHG emissions as a project-level impact, as project GHG emissions would incrementally contribute to global effects. The GHG analysis included in this EIS/EIR is consistent with emerging and evolving guidance on the appropriate scope and methodology for GHG analysis in NEPA and CEQA documents.

The Draft EIS/EIR assumed that each truck trip generated by the Project terminal would travel a distance equal to the average of a local trip length and the trip distance between the POLB and the California/Arizona border (POLA and USACE 2007). Subsequent to the Draft EIS/EIR, new traffic analyses more accurately identified the number of POLB-generated truck trips that enter/leave the SCAB and their associated origins/ destinations. The new data was used to assess GHG emissions from the Project and the NEPA and CEQA Baselines.

Revisions were made to the Draft EIS/EIR annual GHG emissions for all future Project scenarios and NEPA and CEQA Baselines. The corrected analyses show that the annual GHG emissions from trucks decreased substantially for all future Project scenarios compared to those presented in the Draft EIS/EIR. For the reasons mentioned above under criteria pollutants, use of revised VMT data for commuter vehicles resulted in a reduction in GHG emissions for these sources for the CEQA Baseline compared to those presented in the Draft EIS/EIR.

Refer to Appendix A-1 for additional details regarding truck trips, train trips, and ships visits assumptions that were made for purposes of the GHG calculations. Specifically, for trucks, an in-state average distance was developed for trips within California. Updated VMT data which corrected inaccurate VMT data used in the Draft EIS/EIR analyses were used in the Final EIS/EIR GHG analysis. Similarly, for trains, emissions were accounted for all the way to the California border. Ship emissions were also calculated based upon assumed travel and operations while in California waters. For the consumption of electricity generated offsite, all GHG emissions were included in the analysis without regard to whether they were generated within or outside California, since in part it was not possible to determine the exact source and location of power generation, and in general, a portion of the electricity used in California is generated outside of the state. This approach is consistent with the goal of the CCAR program to report and monitor all GHG emissions within the State of California in accordance with AB 32. These same assumptions were applied to the baseline scenarios.

The Port and USACE conclude that use of the California boundary to delineate the domain for the estimation of Project GHG emissions is adequate to provide an indicator of the significance of proposed GHG emissions.

GHG Emissions from Project Construction

Table 3.2-27 summarizes the GHG emissions generated from each construction phase/stage for Alternative 1. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

There were no changes in the operational data used for the construction GHG emissions calculations in the Final EIS/EIR from what was used in the Draft EIS/EIR.

GHG Emissions from Project Operations

Table 3.2-28 summarizes the annual unmitigated GHG emissions that would occur within California from operation of the proposed Project. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

As described in the introductory section to Section 3.2, incorrect VMT data were used in the Draft EIS/EIR analyses for emission calculations of off-terminal operational truck and auto activity emissions for the Project. Revisions were made to the annual GHG emissions for all future Project scenarios in the Final EIS/EIR. The revisions resulted in substantial reductions in truck VMT for future Project scenarios within the California analysis region. The corrected analyses show that annual vehicle emissions for the CEQA Baseline decreased slightly and future Project scenarios decreased substantially for all future Project scenarios within the SCAB region and California.

<u>CEQA Impact Determination</u>

Tables 3.2-27 and 3.2-28 show that annual CO_2e emissions would increase relative to the CEQA Baseline in each Project construction phase/stage and future year of operation, respectively. These increases would produce a significant impact under CEQA.

Mitigation Measures

Measures that reduce electricity consumption or fossil fuel usage from Project emission sources would reduce proposed GHG emissions. The following operational mitigation measures already developed for criteria pollutant emissions under **Impact AQ-3** would also reduce GHG emissions.

AQ-5: Shore-to-Ship Power ("Cold Ironing"). All OGVs that call at the Middle Harbor container terminal shall utilize shore-to-ship power while at berth according to the following schedule: (1) 33 percent of all OGVs by December 2009 (2) 66 percent of all OGVs by March 2012, and (3) 100 percent of all OGVs by December 2014. Lease stipulations shall include consideration of alternative technologies that achieve 90 percent of the emission reductions of cold-ironing.

Based on the proposed wharf construction schedule, 33 percent of all OGV shall cold-iron in 2010 and this activity shall increase to 100 percent by 2015. This measure equates to CAAP measure OGV2.

The use of electricity from the power grid would reduce GHG emissions during berthing, as electricity is produced more efficiently at centralized power plants compared to smaller auxiliary engines on ships. In addition, some electricity generated by the LADWP comes from renewable sources, such as hydroelectric, which further reduces the amount of fossil fuel combustion and GHG output per average unit of electrical power generation. As a result, a ship that uses cold-ironing at berth would reduce its auxiliary power GHG emissions by about 47 percent, compared to a ship using its own auxiliary engines for power.

AQ-7a (*added in Final EIS/EIR)*: High Efficiency RMG Cranes. The Project terminal operator shall replace all diesel-powered RTGs with electric-powered RMGs, as soon as feasible, but no later than the completion of construction in 2020. Each RMG shall include high efficiency, regenerative drive systems.

As explained above for cold-ironing, electric-powered RMGs would generate substantially fewer GHG emissions compared to diesel-powered units.

AQ-9: Clean Railyard Standards. The expanded Pier F intermodal railyard shall incorporate the cleanest locomotive technologies into its operations. Technologies that reduce fuel consumption or use alternative fuels would reduce GHG emissions. These include diesel-electric hybrids, multiple engine generator sets, use of alternative fuels, and idling shut-off devices. Because some of these systems are not yet available, but are expected to be available within the next few years, this measure has not been quantified. However, implementation of this measure would reduce the Project's GHG emissions by less than 0.1 percent.

AQ-10: Truck Idling Reduction Measures. The Middle Harbor container terminal operator shall minimize on-terminal truck idling and emissions. Potential methods to reduce idling include, but are not limited to (1) maximize the durations when the main gates are left open, including during off-peak hours; (2) implement a container tracking and appointment-based truck delivery and pick-up system to minimize truck queuing; and (3) design a gate system to exceed expected truck flow capacity and thereby minimize truck queuing.

A reduction in on-terminal truck activities would reduce fuel consumption and resulting GHG emissions. The estimate of unmitigated on-terminal trucking emissions considered the efficiencies of movement designed into the proposed Middle Harbor container terminal and, therefore, assumed a low rate of on-terminal idling. Nevertheless, additional design measures proposed in **Mitigation Measure AQ-10** would further reduce on-terminal truck activities and associated GHG emissions.

AQ-11: Slide Valves on OGV Main Engines. The Port would require the use of slide-type fuel valves on OGV, where feasible. The increases in fuel efficiency would result in less fuel use and reductions in GHG emissions.

The following additional mitigation measures specifically target sources of Project GHG emissions. They were developed through an applicability and feasibility review of possible GHG measures identified in the *Climate Action Team Report to Governor Schwarzenegger and the California Legislature* (Cal-EPA 2006) and ARB's *Proposed Early Actions to Mitigate Climate Change in California* (ARB 2007). The strategies proposed in these two reports for the commercial/industrial sector are listed in Table 3.2-29, along with a determination of applicability to the Project. For a disclosure of the evaluation process used to determine the feasibility of Project GHG mitigation measures, see the response to comment DOJ-5 in Chapter 10.

AQ-12: Expanded VSRP for GHG. All OGV that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from the California overwater border to the Precautionary Area.

The average cruise speed for a container vessel ranges from about 18 to 25 knots, depending on the size of a ship (larger ships generally cruise at higher speeds). For a ship with a 24-knot cruise speed, for example, a reduction in speed to 12 knots reduces the main engine load factor from about 83 to 10 percent, due to the cubic relationship of load factor to speed. There would be a corresponding reduction in overall container ship transit GHG emissions (main and auxiliary engines) from the California overwater border to the Precautionary Area.

AQ-13: Low-sulfur Fuels in OGV for GHG. All OGV shall use 0.2 percent or lower sulfur MGO fuel in vessel auxiliary and main engines at berth and within California State Waters, or implement equivalent emission reductions.

Use of 0.2 percent sulfur MGO fuel in OGV would reduce GHG emissions by about 14 percent compared to the use of high sulfur residual fuel oil.

AQ-14: LEED. The main terminal building shall obtain the LEED gold certification level.

LEED certification is made at one of the following four levels, in ascending order of environmental sustainability: certified, silver, gold, and platinum. The certification level is determined on a point-scoring basis, where various points are given for design features that address the following areas (U.S. Green Building Council 2005):

- Sustainable Sites;
- Water Efficiency;
- Energy & Atmosphere;
- Materials & Resources;
- Indoor Environmental Quality; and
- Innovation & Design Process.

As a result, a LEED-certified building would be more energy efficient, thereby reducing GHG emissions compared to a conventional building design. On-terminal electricity consumption represents about three percent of the total Project GHG emissions. The effects of this measure are not quantified in this analysis.

AQ-15: Compact Fluorescent Light Bulbs. All interior terminal building lighting shall use compact fluorescent light bulbs. Fluorescent light bulbs produce less waste heat and use substantially less electricity than incandescent light bulbs.

Although not quantified in this analysis, implementation of this measure is expected to reduce Project GHG emissions by less than 0.1 percent.

AQ-16: Energy Audit. The Middle Harbor container terminal tenant shall conduct a third party energy audit every five years and install innovative power saving technologies where feasible, such as power factor correction systems and lighting power regulators. Such systems help to maximize usable electric current and eliminate wasted electricity, thereby lowering overall electricity use.

This mitigation measure primarily targets large on-terminal electricity consumers such as on-terminal lighting and electric wharf gantry cranes. These sources consume the majority of on-terminal electricity and account for about one percent of overall Project GHG emissions. Therefore, implementation of power saving technologies at the terminal could reduce overall Project GHG emissions by a fraction of one percent.

AQ-17: Solar Panels. The applicant shall install solar panels on the main terminal building.

Solar panels would provide the terminal building with a clean source of electricity to replace some of its fossil fuel-generated electricity demand.

Although not quantified in this analysis, implementation of this measure is expected to reduce Project GHG emissions by less than 0.1 percent.

AQ-17a (*added in Final EIS/EIR)*: Solar Carports. The applicant will install carport-mounted PV solar panels over the employee and visitor parking areas to the maximum extent feasible.

AQ-18: Recycling. The terminal buildings shall achieve a minimum of 40 percent recycling by 2012 and 60 percent recycling by 2015. Recycled materials shall include:

- White and colored paper;
- Post-it notes;
- Magazines;
- Newspaper;
- File folders;

- All envelopes including those with plastic windows;
- All cardboard boxes and cartons;
- All metal and aluminum cans;
- Glass bottles and jars; and
- All plastic bottles.

In general, products made with recycled materials require less energy and raw materials to produce than products made with un-recycled or raw materials. This savings in energy and raw material use translates into GHG emission reductions. The effectiveness of this mitigation measure was not quantified due to the lack of a standard emission estimation approach.

AQ-19: Tree Planting. The Port shall plant shade trees around the main terminal building. Trees act as insulators from weather, thereby decreasing energy requirements. Onsite trees also provide carbon storage (AEP 2007).

Although not quantified, implementation of this measure is expected to reduce the Project's GHG emissions by less than 0.1 percent.

AQ-19a (*added in Final EIS/EIR)*: Tree Planting – Transportation Corridors. The Port shall plant new shade trees on Port-controlled lands adjacent to the roads into the Middle Harbor container terminal to the extent practicable given safety and other land use considerations.

AQ-20 (*added in Final EIS/EIR)*: Cool Roofs. Buildings on the Middle Harbor container terminal will incorporate cool roofing systems to the extent feasible. Building rooftop areas which are covered with solar panels in accordance with Mitigation Measure AQ-17 shall be exempt from this measure.

AQ-21 (*added in Final EIS/EIR)*: Energy Efficient Boom Flood Lights: The Port shall install boom flood lights with energy efficient features on existing and new dock cranes to the extent feasible. Such features may include, but are not limited to, use of photo cells/timers, low energy fixtures, and light-spillover reduction features, electronic ballasts, use of double filaments, and applying auto-switch-off controls when the crane boom is up.

AQ-22 (*added in Final EIS/EIR)*: Reefer Lighting. The terminal tenant shall downsize light fittings and associated electrical power usage at reefer platforms to the extent feasible.

AQ-23 (*added in Final EIS/EIR)*: Employee Carpooling. The construction contractor and terminal tenant shall encourage construction and terminal employees to carpool or to use public transportation. These employers shall provide incentives to promote the measure, include preferential parking for carpoolers, vanpool subsidies, and they shall provide information to employees regarding the benefits of alternative transportation methods.

AQ-24 (*added in Final EIS/EIR)*: Mitigation for Indirect GHG Emissions. The terminal tenant shall be required to use green commodities, such as those available from the California Climate Action Registry's Climate Action Reserve, to offset carbon emissions associated with the terminal's electricity consumption subject to the limitation specified below. This measure applies to all electricity consumed at the terminal, including shore-to-ship power usage ("cold ironing"). The terminal-related carbon emissions from electricity consumption will be calculated each year based on the local utility's carbon intensity for that year as recognized by the State of California. The tenant may adjust the carbon intensity value to wholly reflect any carbon offsets provided by the electricity deliverer (i.e., point of generation or point of importation) under applicable California and/or federal cap-and-trade regulations (i.e., no double offsetting).

The Port is limiting the potential cost of this measure. The maximum expenditure for purchased offsets required under this measure shall not exceed 15 percent of the terminal electricity costs for any given year (i.e., cost of offsets shall not exceed 15 percent of terminal electricity costs [US$ basis]).

With respect to **Mitigation Measure AQ-24**, the reason the Port is limiting the potential cost of this measure because the future implementation cost for this measure is not known. It is could potentially be affected by several unknown factors including: (a) the future carbon intensity of electricity delivered by the local utility, (b) the future price of green commodities (RECs and VERs), (c) the price of electricity, and (d) the effects of future cap-and-trade regulations on the (a), (b) and/or (c).

AQ-27 (*added in Final EIS/EIR)*: Electrical Regenerative Systems on Dock Cranes. Port will require that the terminal operator to have electric regenerative systems on all Project dock cranes in Project year 1.

Implementation of **Mitigation Measures AQ-25 and AQ-26** would provide an opportunity to further reduce proposed GHG emissions beyond the Project-specific measures identified above.

The replacement of existing electric shore-side gantry cranes with proposed new cranes would reduce electricity usage on a per-lift basis. The Port estimates that the new cranes would be 10 to 20 percent more energy efficient than the replaced cranes and this improvement would reduce Project GHG emissions.

As mentioned in Section 3.2.1.3, the Port is in the process of developing the Climate Change/Greenhouse Gas (CC/GHG) Strategic Plan. This Plan will outline the overall approach for mitigating potential project-specific and/or cumulative GHG impacts of projects through the modernization and/or upgrading of marine terminals and other facilities in the Long Beach Harbor District. One element of the Port's CC/GHG Plan is the Greenhouse Gas Emission Reduction Program Guidelines (GHG Guidelines). These Guidelines describe a procedure for the evaluation and prioritization of GHG emission reduction projects and practices that the Port may fund consistent with the Port's overall CC/GHG reduction goals. Several types of projects are described in the Guidelines, but other projects and practices may be defined as the CC/GHG Plan evolves. The GHG Guidelines were adopted by the Board of Commissioners on March 2, 2009, and may be revised accordingly as the CC/GHG Plan evolves.

To partially address the impacts of the Middle Harbor Project, the Port will require this Project to fund the GHG Emission Reduction Program. This money will be used to fund one or more projects submitted to the Board of Harbor Commissioners for review and approval in accordance with the GHG Emission Reduction Program Guidelines. How this money will be used and the amount of GHG emissions reduced will depend on the mix of submitted projects approved according to the Guidelines. Applicable GHG reduction projects listed in the Guidelines include, but are not limited to, generation of green power from renewable energy sources, ship electrification, goods movement efficiency measures, cool roofs to reduce building cooling loads and the urban heat island effect, building upgrades for operational efficiency, tree planting for biological sequestration of CO_2, energy-saving lighting, and purchase of RECs.

The Port is proposing to require the Project to provide grant funding of $5 million for the GHG mitigation program. Although it is not known which projects will ultimately be proposed and selected, the example above shows that this level of funding would provide the means to reduce GHG emissions, with an emphasis on projects that can be implemented locally. Depending on the types of projects submitted and ultimately approved, $5 million in grant funding could annually reduce 22,000 metric tons CO_2e per year (based on the project mix described above) to 333,000 metric tons CO_2e per year (based on the most cost-effective projects at $15/ton CO_2e). From the Middle Harbor Project EIS/EIR, the change in GHG compared to the CEQA Baseline ranged from an increase of 41,797 to an increase of 247,058 metric tons CO_2e per year in 2010 and 2030, respectively. Compared to the NEPA Baseline, the change in GHG emissions ranged from reduction of 2,287 to an increase of 36,360 metric tons CO_2e per year in 2010 and 2030, respectively. Depending on the cost-effectiveness of the submitted and approved projects, the grant funding from the Middle Harbor Project could mitigate some or all of these GHG increases. Projects approved pursuant to the Guidelines can be implemented shortly after grant funding becomes available, which will occur once the Middle Harbor Project receives final approval and any appeals have been exhausted. Since the mix of submitted and approved GHG mitigation projects (and their cost-effectiveness) cannot be determined *a priori*, the Port nonetheless concludes that the impacts of GHG emissions from the Middle Harbor Project remain significant and unavoidable.

AQ-28: Greenhouse Gas Emission Reduction Program (GHG Program). To partially address the cumulative GHG impacts of the Middle Harbor Redevelopment Project, the Port will require this Project to provide funding for the GHG Program in the amount of $5 million. This money will be used to pay for measures pursuant to the GHG Emission Reduction Program Guidelines, include, but are not limited to, generation of green power from renewable energy sources, ship electrification, goods movement efficiency measures, cool roofs to reduce building cooling loads and the urban heat island effect, building upgrades for operational efficiency, tree planting for biological sequestration of CO_2, energy-saving lighting, and purchase of renewable energy certificates (RECs).

The timing of the payments pursuant to **Mitigation Measure AQ-28** shall be made by the later of the following two dates: (1) the date that the Port issues a Notice to Proceed or otherwise authorizes the commencement of construction on the Phase 1 Construction Contract; or (2) the date that the Middle Harbor Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication.

Future Port-wide greenhouse gas emission reductions are also anticipated through AB 32 rule promulgation. However, such reductions have not yet been quantified, as AB 32 implementation is still under development by the ARB.

The changes in mitigated operational GHG emissions from the Draft EIS/EIR to the Final EIS/EIR are to a large extent due to significant revisions to truck VMT estimates and to a lesser extent to revisions in the commuter VMT estimates used in the Final EIS/EIR GHG calculations, and the impacts of the various mitigation measures described above.

The updated truck and commuter VMT data used in the Final EIS/EIR result in mitigated operational GHG emissions (Table 3.2-30) which are much lower than those presented in the Draft EIS/EIR (Table 3.2-28) for both NEPA and CEQA impacts, except for the year 2020 NEPA increment.

Significance of Impacts after Mitigation

Table 3.2.30 shows the reduction in Project GHG emissions due to the implementation of **Mitigation Measures AQ-5, AQ-7a, AQ-12, and AQ-13**. Use of these measures would reduce Project emissions of CO_2e by 16 to 18 percent from unmitigated levels, depending on the Project year. Although not quantified in this analysis, implementation of **Mitigation Measures AQ-4, AQ-6 through AQ-11, and AQ- 14 through AQ-28** would further reduce Project GHG emissions. Specifically, **Mitigation Measure AQ-24 (Mitigation for Indirect GHG Emissions)** will require the terminal operator to use green commodities to offset carbon emissions associated with the terminal's electricity consumption (subject to limitations), which would result in additional reductions in the GHG emissions. Table 3.2-30 shows that the mitigated Project CO_2e emissions would increase relative to CEQA Baseline levels. Therefore, after mitigation, Project GHG impacts would remain significant under CEQA.

As described in Section 3.2.1.2, it is estimated that airborne emissions of black carbon contribute to global warming, due to its ability to warm the atmosphere and melt snow packs and polar ice if deposited onto these surfaces. Black carbon is a component of DPM emissions generated by the Project.

According to the International Polar Foundation (IPF), black carbon is the most potent climate-warming aerosol. Black carbon particles, being black, absorb all wavelengths of sunlight and then re-emit this energy to the surrounding environment as infrared radiation. If produced continuously, and in large quantities, black carbon can have a large impact on climate, especially in the cryosphere. The latest research shows that black carbon is second only to CO_2 as far as major contributors to climate change. Soot produced by fossil fuels and biofuels combined may contribute to about 16 percent of gross global warming, according to Dr. Mark Jacobson, Civil and Environmental Engineer at Stanford University in California (IPF 2008).

According to IPC, experts believe that black carbon has been responsible for significant warming in the Arctic. As much as 30 percent of the warming in the Arctic can be attributed to anthropogenic black carbon. During Arctic winters when there is little sunlight, the presence of dark soot particles in the snow doesn't make much difference. Only when solar radiation begins to increase rapidly in the spring and the melting season begins does black carbon have its greatest impact on snow cover. The presence of black carbon on the snow makes it absorb more solar radiation than it otherwise would, leading to more intense melting earlier in the spring. As snow and ice melt, this exposes darker, less reflective surfaces such as land and open water and creates a positive feedback situation which leads to accelerated melting, commonly referred to as snow-albedo feedback (IPF 2008).

The Final EIS/EIR includes all feasible measures to reduce proposed DPM (of which black carbon is a subset) and GHG emissions. Review of Table 3.2-20 shows that the mitigated Project would produce lower operational emissions of DPM, and therefore less black carbon, in all future years compared to the CEQA Baseline.

Proposed measures that would reduce fuel usage, such as **Mitigation Measures AQ-4, AQ-5, and AQ-10,** would directly reduce black carbon emissions. Additionally, Final EIS/EIR Mitigation Measure AQ-25, that requires the terminal tenant in 2015 and every five years afterwards to review new air quality technological advancements for the purpose of implementing new feasible mitigations, could identify measures that would further reduce

Project emissions of black carbon. This effect would reduce the overall significant impact to climate change from other Project emissions.

NEPA Impact Determination

Table 3.2-30 shows that in each future Project year, annual operational CO_2e emissions would exceed those estimated for the NEPA Baseline, except for year 2015. However, because no NEPA significance threshold has been established, no determination of significance has been made for this impact.

Mitigation Measures

Although mitigation measures for GHG impacts are not required under NEPA, **Mitigation Measures AQ-2 through AQ-28** would reduce GHG emissions under NEPA.

Significance of Impacts after Mitigation

Table 3.2-30 shows that mitigated Project CO_2e emissions (1) would exceed those estimated for the NEPA Baseline in 2010, 2020, and 2030; and (2) would be less than the NEPA Baseline levels estimated for 2015.

3.2.2.4 Alternative 2 – 315-Acre Alternative

Alternative 2 would add 24.7 net acres of newly created land to the existing 294-acre Project site by filling Slip 1 between Piers E and F (Berths E12-E14 and F1-F4). Under this alternative, the proposed 40-acre East Basin would not be filled.

The same changes made to the Draft EIS/EIR air quality assumptions that were used in the Final EIS/EIR air quality analysis for Alternative 1, as described above, were also applied to Alternative 2. Thus, they are not repeated below. The regulations/CAAP measures assumed for Alternative 2 operational scenario are presented in Table 3.2-11 and for mitigated Alternative 2 are the same as for mitigated Alternatives 1 and 3.

Table 3.2-64 provides a comparison of the projected mitigated annual average daily and peak daily Project (Alternative 2) NEPA and CEQA emission increments in the Draft EIS/EIR (Tables 3.2-34 and 3.2-35) and the Final EIS/EIR (Tables 3.2-36 and 3.2-37). Also noted are any differences in significance determinations between the Draft EIS/EIR and Final EIS/EIR with regard to the mitigated average and peak daily NEPA and CEQA emission increments. Importantly, these revisions did not result in any new significant impacts that were not identified in the Final EIS/EIR for Alternative 2, and in a few cases, resulted in elimination of a few significant impacts for peak daily NEPA emissions increments compared to the NEPA Baseline.

Construction Impacts

Impact AQ-1: Alternative 2 construction would produce emissions that exceed SCAQMD emission significance thresholds.

Table 3.2-31 presents estimates of the unmitigated daily air emissions that would occur during each phase/stage of construction for Alternative 2. To determine the significance of emissions based on criterion AQ-1, the analysis included a review of the Alternative 2 construction schedule to determine a peak daily period of activity and resulting emissions for comparison to the SCAQMD daily emission thresholds.

CEQA Impact Determination

As shown in Table 3.2-31, during a peak day of activity, Alternative 2 construction would produce significant levels of VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$ emissions under CEQA. Therefore, these would represent significant air quality impacts under CEQA. The main source of combustive emissions would occur from tugboats that are used to assist in wharf construction, dredging, and dike construction activities. With regard to PM_{10} and $PM_{2.5}$ emissions, the overwhelming majority of the emissions would occur in the form of fugitive dust.

Mitigation Measures

Mitigation Measure AQ-1 would be applied to reduce significant levels of PM_{10} and $PM_{2.5}$ emissions. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce combustive emissions from proposed sources. Although not quantified in the analysis, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** (described above under the proposed Project) would further reduce combustive emissions from proposed construction.

Significance of Impacts after Mitigation

Table 3.2-31 shows that implementation of **Mitigation Measure AQ-1** would substantially reduce emissions of PM_{10} and $PM_{2.5}$. However, mitigated construction emissions under CEQA would exceed the VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$

SCAQMD emission thresholds. As a result, these emissions would remain significant under CEQA.

NEPA Impact Determination

As shown in Table 3.2-31, during a peak day of activity, construction of Alternative 2 would produce significant levels of VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$ emissions under NEPA. Therefore, these represent significant air quality impacts under NEPA. The main source of combustive emissions would occur from tugboats that are used to assist in wharf construction, dredging, and dike construction activities.

Mitigation Measures

Mitigation Measures AQ-1 through AQ-3a would apply to this impact. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce combustive emissions from proposed sources. Although not quantified in the analysis, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** (described above under the proposed Project) would further reduce combustive emissions from proposed construction.

Significance of Impacts after Mitigation

Table 3.2-31 shows that implementation of **Mitigation Measure AQ-1** would reduce emissions of PM_{10} and $PM_{2.5}$ to below the SCAQMD emission thresholds. However, mitigated construction emissions would exceed the SCAQMD significance thresholds for VOC, CO, and NO_x. As a result, these emissions would remain significant under NEPA.

Impact AQ-2: Alternative 2 construction would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate the ambient offsite impacts of Alternative 2 construction emissions. The analysis focused on a peak day of emissions that would occur from onsite activities and consistent with the methods used to estimate ambient construction impacts from Alternative 1. The criteria modeling analysis did not consider offsite emission sources from truck hauling and tugboat/barge activities per SCAQMD guidance (personal communication, Koizumi, J. 2005). Those emissions are addressed under **Impact AQ-1**. Appendix A-2 contains documentation of the Alternative 2 construction emissions included in the dispersion modeling analysis.

Peak day emissions of CO and NO_2 from Alternative 2, which are identical to Alternative 1, would occur during Phase 1/Stage 1 as a result of (1) container yard paving; (2) E24 wharf construction; (3) roll surcharge; (4) sheet pile bulkhead demolition; and (5) ground improvement activities. Peak day emissions of PM_{10} and $PM_{2.5}$ would occur simultaneously during Phase 1/Stage 4 through Phase 1/Stage 6 as a result of (1) Seaside Railyard area redevelopment; (2) new container yard construction; and (3) Berth F6-F10 wharf improvements. Table 3.2-31 presents the maximum ambient offsite impacts estimated for unmitigated Alternative 2 construction activities.

CEQA Impact Determination

The data in Table 3.2-32 show that, the maximum offsite 24-hour PM_{10} incremental impact of 34.5 $\mu g/m^3$ would exceed the SCAQMD threshold of 10.4 $\mu g/m^3$. As a result, unmitigated emissions from Alternative 2 construction would produce a significant ambient 24-hour PM_{10} impact under CEQA. All other pollutant impacts would remain below significance levels.

Mitigation Measures

Implementation of **Mitigation Measure AQ-1** would reduce emissions of fugitive dust (PM_{10} and $PM_{2.5}$) during construction of Alternative 2. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available that would reduce NO_2 impacts to below significance. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would further reduce combustive emissions and their resulting ambient impacts from proposed construction.

Significance of Impacts after Mitigation

Table 3.2-33 presents the maximum ambient offsite impacts estimates for mitigated Alternative 2 construction activities. These data show a maximum offsite 24-hour PM_{10} impact of 13.6 $\mu g/m^3$, which would exceed the SCAQMD threshold of 10.4 $\mu g/m^3$. As a result, after mitigation, Alternative 2 construction emissions would remain significant for 24-hour PM_{10} impact under CEQA. All other pollutant impacts would remain below significance levels.

NEPA Impact Determination

Unmitigated Alternative 2 construction activities would produce ambient offsite impacts that would exceed the SCAQMD 24-hour PM_{10} ambient thresholds. Therefore, unmitigated emissions from

Alternative 2 construction would produce a significant air quality impact under NEPA which is identical to the Alternative 2 CEQA impact (Table 3.2-32).

Mitigation Measures

Implementation of **Mitigation Measure AQ-1** would reduce emissions of fugitive dust (PM_{10} and $PM_{2.5}$) during Alternative 2 construction. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available that would reduce combustive emission from proposed construction sources. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would further reduce combustive emissions and their resulting ambient impacts from Alternative 2 construction activities.

Significance of Impacts after Mitigation

The data in Table 3.2-33 show that after mitigation, the maximum offsite 24-hour PM_{10} incremental impact of 13.6 µg/m^3 would exceed the SCAQMD significance threshold of 10.4 µg/m^3. As a result, Alternative 2 construction emissions would remain significant after mitigation for ambient one-hour NO_2 and 24-hour PM_{10} impacts under NEPA. All other pollutant impacts would remain below significance levels.

Impact AQ-3: Alternative 2 would result in operational emissions that exceed SCAQMD thresholds of significance.

Tables 3.2-34 and 3.2-35 present estimates of the unmitigated annual average and peak daily air emissions that would occur from the operation of Alternative 2 for milestone years 2010, 2015, 2020, and 2030.

<u>CEQA Impact Determination</u>

CEQA impacts for average daily emissions, which are presented in the "Net Change from 2005 CEQA Baseline" rows in Table 3.2-34, show that in all future years, unmitigated Alternative 2 would produce lower operational emissions compared to CEQA Baseline levels in 2005. As a result, unmitigated Alternative 2 would not exceed any SCAQMD daily emission threshold, and would produce less than significant average daily emissions under CEQA.

The data in Table 3.2-35 show that for all Project years, unmitigated Alternative 2 would produce lower peak daily operational emissions compared to the CEQA Baseline peak daily emissions in 2005 for all years, except that in 2010, when the net change between the unmitigated Alternative 2 peak daily operational emissions and the CEQA Baseline peak daily emissions would exceed the SCAQMD daily NO_x threshold. As a result, unmitigated Alternative 2 would produce less than significant peak daily emissions under CEQA for all pollutants and Project years except for NO_x in 2010.

Mitigation Measures

Mitigation Measures AQ-4 through AQ-8 were applied to Alternative 2 operations to reduce significant levels of NO_x emissions during a peak day of activity. Although not quantified in this analysis, **Mitigation Measures AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions from Project operations.

Significance of Impacts after Mitigation

Table 3.2-37 shows that the net change between the mitigated Alternative 2 and CEQA Baseline peak daily operational emissions would not exceed the SCAQMD daily NO_x significance threshold during any Project year. As a result, NO_x emissions during a peak day of activity would be reduced to less than significant levels under CEQA.

<u>NEPA Impact Determination</u>

NEPA impacts of average daily operational emissions, which are presented in the "Net Change from NEPA Baseline" rows in Table 3.2-34, show that during each milestone year, the net change between unmitigated Alternative 2 and NEPA Baseline average daily emissions would exceed the SCAQMD daily NO_x significance thresholds. Additionally, in 2010, the NEPA increment would exceed the SCAQMD daily emission significance thresholds for SO_X, PM_{10}, and $PM_{2.5}$.

The data in Table 3.2-35 show that the net change between unmitigated Alternative 2 peak daily operational emissions and NEPA Baseline average daily emissions would exceed SCAQMD daily significance thresholds for: (1) VOC in 2010, 2015, and 2030; (2) CO in 2030; (3) NO_x in all Project years; (4) SO_2 in 2010; and (5) PM_{10}, and $PM_{2.5}$ in 2010.

Mitigation Measures

Mitigation Measures AQ-4 through AQ-8 were applied to Alternative 2 operations to reduce significant levels of criteria pollutant emissions. Although not quantified in this analysis, **Mitigation Measures AQ-9 through AQ-11 and AQ-25 and**

AQ-26 would further reduce combustive emissions from Project operations.

Significance of Impacts after Mitigation

Table 3.2-36 shows that the net change between the mitigated Alternative 2 and NEPA Baseline average daily operational emissions would exceed the SCAQMD daily NO_x significance threshold in 2015 and 2030. As a result, these exceedances of the SCAQMD NO_x emission threshold represent significant levels of average daily NO_x emissions that would occur during the operation of Alternative 2 under NEPA. All other pollutant impacts would remain below the significance levels.

Table 3.2-37 shows that the net change between the mitigated Alternative 2 peak daily operational emissions and the NEPA Baseline average daily emissions would exceed the SCAQMD daily significance thresholds for NO_x in all Project years. As a result, the mitigated Project would produce significant levels of NOx during a peak day of activity under NEPA for all Project years. All other pollutant impacts would remain below the significance levels.

Impact AQ-4: Alternative 2 operations would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate ambient offsite impacts of the Alternative 2 operational emissions. The analysis focused on year 2010, representing the time period when this Alternative would generate the highest amount of emissions within and adjacent to the Middle Harbor container terminal (i.e., the ship docking and hoteling, terminal equipment, onroad trucks, and trains), which would produce the highest ambient impacts in the Port and onshore regions for any Project year. The analysis was consistent with the methods used to estimate ambient operational impacts from Alternative 1. Appendix A-2 includes a discussion of the Alternative 2 operational emissions dispersion modeling analysis.

CEQA Impact Determination

Table 3.2-38 presents the projected maximum ambient offsite impacts for unmitigated Alternative 2 operations. These data show that the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient significance thresholds. As a result, unmitigated emissions from Alternative 2 operations would contribute to significant levels of one-hour and annual NO_2 under CEQA. All other pollutant impacts would remain below the significance levels.

Mitigation Measures

Table 3.2-39 presents the maximum ambient offsite impacts estimated for Alternative 2 operations due to implementation of **Mitigation Measures AQ-4 through AQ-8 (excluding AQ-7a)**. These data show that with mitigations, the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient thresholds. Although not quantified in this analysis, **Mitigation Measures AQ-7a, AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions and their resulting ambient impacts from proposed operations. No additional feasible measures are available for consideration at this time.

Significance of Impacts after Mitigation

Ambient one-hour and annual NO_2 impacts from mitigated Alternative 2 operations would remain significant under CEQA. However, these impacts would be less than the ambient NO_2 impacts produced from existing terminal operations in 2005.

NEPA Impact Determination

Table 3.2-38 shows that the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient thresholds. As a result, unmitigated emissions from Alternative 2 operations would contribute to significant levels of one-hour and annual NO_2 under NEPA. All other pollutant impacts would remain below significant levels.

Mitigation Measures

Table 3.2-39 presents the maximum ambient offsite impacts estimated for Alternative 2 operations with the implementation of **Mitigation Measures AQ-4 through AQ-8 (excluding AQ-7a)**. These data show that with mitigations the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient thresholds. **Mitigation Measures AQ-7a, AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions and their resulting ambient impacts from proposed operations. No additional feasible measures are available for consideration at this time.

Significance of Impacts after Mitigation

Ambient one-hour and annual NO_2 impacts from mitigated Alternative 2 operations would remain significant under NEPA. However, these impacts would be less than the ambient NO_2 impacts produced from existing terminal operations in 2005.

Impact AQ-5: Alternative 2 would not create objectionable odors to sensitive receptors.

Alternative 2 operational activities would increase air pollutants due to the combustion of diesel fuels. Some individuals may sense that diesel combustion emissions (mainly VOC and PM) are objectionable in nature, although quantifying the odorous impacts of these emissions to the public is difficult.

<u>CEQA Impact Determination</u>

The data in Tables 3.2-33 and 3.2-34 show that in all future years, unmitigated operations from Alternative 2 would produce lower diesel combustion products and associated odors compared to CEQA Baseline levels. As a result, Alternative 2 operations would produce less than significant odor impacts under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11, AQ-25, and AQ-26** would further reduce operational emissions and their associated odor impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

The data in Tables 3.2-34 and 3.2-35 show that unmitigated operations from Alternative 2 would produce diesel combustion products and associated odors that would exceed NEPA Baseline levels (1) in 2010 on an average day and (2) in all future years during a peak day of activity. Since the distance between Alternative 2 emission sources within the terminal and the nearest residents is at least 0.4 miles, this distance would be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels. As a result, Alternative 2 operations would produce less than significant odor impacts under NEPA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11, AQ-25, and AQ-26** would further reduce operational emissions and their associated odor impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

Impact AQ-6: Alternative 2 would expose receptors to significant levels of TACs.

An analysis to evaluate public health impacts associated with Alternative 2 construction and operational emissions was conducted using the same methods specified for the Alternative 1 HRA.

The Final EIS/EIR includes an updated cancer risk analysis for the Alternative 2. Similar to the Draft EIS/EIR, the Final EIS/EIR shows that cancer, acute, and chronic risk impacts from Alternative 2 would be insignificant under both NEPA and CEQA. However, since the analysis addresses CEQA (Project minus CEQA) and NEPA increments (Project minus NEPA) in most instances the maximum impacts locations changed from the Draft EIS/EIR.

Table 3.2-40 presents estimates of the maximum cancer risk and non-cancer HHI increments associated with Alternative 2. The values presented for each receptor type correspond to the receptor with the maximum increment. The cancer risk and non-cancer HHI increments at all other receptors within the modeling domain would be less than those shown in Table 3.2-40. Figures A-3-16 through A-3-18 in Appendix A-3 show the distribution of predicted residential cancer risks within the modeling domain for the (1) unmitigated Alternative 2, (2) unmitigated CEQA increment (unmitigated Alternative 2 minus CEQA Baseline), and (3) unmitigated NEPA increment (unmitigated Alternative 2 minus NEPA Baseline).

As previously mentioned, the focus of the HRA in this EIS/EIR is identification of the maximum incremental impact of an alternative (i.e., alternative impact minus baseline impact). Emission source locations and strengths vary substantially between the NEPA and CEQA baselines. Therefore, it is expected that the individual baseline impact values that result in the maximum NEPA and CEQA incremental impacts would differ. Consequently the locations of the maximum NEPA and CEQA incremental impacts would occur at different locations.

Changes to emissions in the mitigated Alternative 2 scenario from the Draft EIS/EIR to the Final EIS/EIR account for a slight increase in the maximum CEQA increments for the residential, occupational and sensitive receptor sets. All maximum CEQA increments for the mitigated Alternative 2 scenario remain negative and risk values do not exceed the significance criterion of 10 in a million. Maximum NEPA increments for the mitigated Alternative 2 scenario also see changes by comparison to the Draft EIS/EIR. The most significant change is to the maximum NEPA occupational increment decreasing from 16 in one million in the Draft EIS/EIR (Table 3.2-39) to eight in one million in the Final EIS/EIR (Table 3.2-41), which does not exceed the significance criterion. The decrease in the NEPA increment is attributed to the reduction in TAC emissions from new control and mitigation measures, including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020. There were no differences in the CEQA increment chronic and acute health impact results presented in the Draft EIS/EIR and Final EIS/EIR.

CEQA Impact Determination

Table 3.2-40 shows that the maximum CEQA increment from Alternative 2 for residential cancer risk is predicted to be negative five in one million (-5×10^{-6}). This risk value is less than the significance criterion (10×10^{-6} risk), and therefore would produce a less than significant impact under CEQA. This risk level would occur in the corner of Skyline Drive and East Panorama drive, approximately one mile south of Interstate 405.

The maximum CEQA increment for occupational cancer risk from Alternative 2 is predicted to be negative two in a million (-2×10^{-6}). This risk value is less than the significance criterion of 10 in one million cancer risk, and therefore would produce a less than significant impact under CEQA. This risk level would occur in an industrial area in POLA south of East 22nd Street near Berth 47.

The maximum CEQA increment for cancer risk at a sensitive receptor from Alternative 2 is predicted to be negative two in a million (-2×10^{-6}). This risk value is less than the significance criterion of 10 in one million cancer risk, and therefore would produce a less than significant impact under CEQA. This risk level would occur at the Cleveland Elementary School at 4760 Hackett Avenue in Lakewood. This risk value was conservatively modeled with 70-year residential exposure assumptions.

Table 3.2-40 shows that the maximum CEQA increments for the non-cancer chronic and acute HHIs from Alternative 2 would be less than one at all receptors. Therefore, the non-cancer (chronic and acute) health impacts associated with Alternative 2 would be less than significant under CEQA.

Mitigation Measures

As impacts under CEQA on air quality would be less than significant, no mitigation is required. However, this HRA also presents an evaluation of how **Mitigation Measures AQ-4 through AQ-8** would reduce cancer risks from Alternative 2. Although not quantified in this analysis, implementation of **Mitigation Measures AQ-9 through AQ-11, AQ-25, and AQ-26** also would reduce Project emissions and associated health impacts.

Significance of Impacts after Mitigation

Figures A-3-19 and A-3-20 in Appendix A-3 show the distribution of predicted residential cancer risks within the modeling domain for (1) mitigated Alternative 2, and (2) the mitigated CEQA increment (mitigated Alternative 2 minus CEQA Baseline).

Table 3.2-41 shows that the maximum CEQA increments for cancer risk from mitigated Alternative 2 would be equal to or lower than those estimated for the unmitigated scenario for all receptor types. Mitigated Alternative 2 would produce lower cancer risks in comparison to the CEQA Baseline within the Project region, as shown in Figure A-3-20 in Appendix A-3.

NEPA Impact Determination

Table 3.2-40 shows that the maximum NEPA increment for residential cancer risk from Alternative 2 is predicted to be five in a million (5×10^{-6}). This risk value is less than the significance criterion (10×10^{-6} risk), and therefore would produce a less than significant impact under NEPA. This risk level would occur on the western side of Marina Park Harbor just north of Marina Park Drive.

The maximum NEPA increment for occupational cancer risk from Alternative 2 is predicted to be 15 in one million (15×10^{-6}). This risk value exceeds the significance criterion of 10 in one million (10×10^{-6}) risk, and therefore would produce a significant impact under NEPA. This risk level would occur in the industrial area on Terminal Island at the southeastern corner of Pier A.

The maximum NEPA increment for cancer risk at a sensitive receptor from Alternative 2 is predicted to be six in one million (6×10^{-6}). This risk value is less than the significance criterion of 10 in one million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur at a day care center located near Chavez Elementary School at 730 West Third Street in downtown Long Beach.

Table 3.2-40 also shows that the maximum NEPA increments for the chronic and acute hazard indices from Alternative 2 would be less than one at all receptor locations. Therefore, the non-cancer chronic and acute health effects associated with Alternative 2 would be less than significant impacts under NEPA.

Mitigation Measures

The HRA evaluated how **Mitigation Measures AQ-4 through AQ-8** would reduce cancer risks from Alternative 2 under NEPA. Although not quantified in this analysis, implementation of **Mitigation Measures AQ-9 through AQ-11, AQ-25, and AQ-26** also would reduce Project emissions and associated health impacts.

Significance of Impacts after Mitigation

Figure A-3-21 in Appendix A-3 shows the distribution of predicted residential cancer risks within the modeling domain for the mitigated NEPA increment (mitigated Alternative 2 minus NEPA Baseline).

Table 3.2-41 shows that the maximum NEPA increment for residential cancer risk for mitigated Alternative 2 is predicted to be three in one million (3×10^{-6}). This risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur in a mixed-use area in downtown Long Beach, north of Ocean Boulevard and east of Golden Shore Street

The maximum NEPA increment for occupational cancer risk from the mitigated Alternative 2 is predicted to be eight in one million (8×10^{-6}). This risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur in the industrial area on Terminal Island at the southeastern corner of Pier A. The maximum NEPA increment for sensitive receptor cancer risk from the mitigated Alternative 2 is predicted to be four in one million (4×10^{-6}). This risk value is less than the significance criterion of 10 in a million (10×10^{-6}) risk, and therefore would produce a less than significant impact under NEPA. This risk level would occur at a day care center located near Chavez Elementary School at 730 West 3rd Street in downtown Long Beach.

Table 3.2-41 also shows that the maximum NEPA increments for the chronic and acute hazard indices from mitigated Alternative 2 would be less than one at all receptor locations. Therefore, the non-cancer chronic and acute health effects associated with mitigated Alternative 2 would be less than significant under NEPA.

Based on a comparison of the PM emissions between Alternative 2 and the proposed Project, no significant changes to morbidity or mortality would be expected if Alternative 2 is implemented, in comparison to Alternative 1.

Impact AQ-7: Alternative 2 would not conflict with or obstruct implementation of the applicable AQMP.

Operation of Alternative 2 would produce emissions of nonattainment pollutants primarily from diesel-powered sources. The attainment strategies in the 2007 AQMP plan include mobile source control measures and clean fuel programs. Alternative 2 operations would have to comply with these control measures which will be implemented in SCAQMD rules and regulations. Thus, Alternative 2 would comply with these regulatory requirements which are designed to implement the 2007 AQMP.

The POLB provides SCAG with Port-wide cargo forecasts that are used to simulate growth scenarios in the AQMP and the attainment demonstrations in the AQMP include emission estimates for future growth at the Port. Moreover, because one objective of the AQMP is to improve the flow of goods at the Ports, Alternative 2 and its associated control measures would work in concert to implement the 2007 AQMP. Furthermore, adoption of existing regulations and CAAP measures would reduce emissions from the alternative in comparison to the CEQA Baseline (Table 3.2-18). As a result, Alternative 2 would promote the objectives of the 2007 AQMP.

<u>CEQA Impact Determination</u>

Alternative 2 would not conflict with or obstruct implementation of the 2007 AQMP. Therefore, with regard to criterion AQ-7, impacts from Alternative 2 would be less than significant under CEQA.

Mitigation Measures

As impacts to air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11** would further reduce operational emissions and associated air quality impacts.

Significance of Impacts after Mitigation

Impacts to air quality would be less than significant.

NEPA Impact Determination

Alternative 2 would not conflict with or obstruct implementation of the AQMP. Therefore, in regard criterion AQ-7, impacts from Alternative 2 would be less than significant under NEPA.

Mitigation Measures

As impacts to air quality would be less than significant, no mitigation is required. However, implementation of **Mitigation Measures AQ-4 through AQ-11** would further reduce operational emissions and associated air quality impacts.

Significance of Impacts after Mitigation

Impacts to air quality would be less than significant.

Impact AQ-8: Alternative 2 would produce GHG emissions that would exceed the CEQA threshold.

GHG Emissions from Alternative 2 Construction

Table 3.2-42 summarizes the GHG emissions generated from each phase/stage of Alternative 2 construction. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

GHG Emissions from Alternative 2 Operations

Table 3.2-43 summarizes the annual unmitigated GHG emissions that would occur within California from operation of Alternative 2. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

The changes in mitigated operational GHG emissions for Alternative 2 from the Draft EIS/EIR to the Final EIS/EIR are to a large extent due to significant revisions to truck VMT estimates and to a lesser extent to revisions in the commuter VMT estimates used in the Final EIS/EIR GHG calculations, and the impacts of the various mitigation measures described above that included in Alternative 2.

CEQA Impact Determination

Tables 3.2-42 and 3.2-43 show that annual CO_2e emissions would increase relative to the CEQA Baseline in each Project construction phase/stage and future year of operation. These increases are considered a significant impact under CEQA.

As described in Section 3.2.1.2, it is estimated that airborne emissions of black carbon contribute to global warming, due to its ability to warm the atmosphere and melt snow packs and Polar ice if deposited onto these surfaces. Black carbon is a component of DPM emissions generated by Alternative 2. Review of Table 3.2-36 shows that the mitigated Alternative 2 would produce lower operational emissions of DPM, and therefore black carbon, in all future years compared to the CEQA Baseline. Therefore, this reduction in DPM by the Alternative would represent an incremental benefit to climate change effects produced by black carbon.

Mitigation Measures

Measures that reduce electricity consumption or fossil fuel usage from proposed emission sources would reduce GHG emissions from Alternative 2. The same control measures described for the proposed Project would be applied to Alternative 2 to reduce GHG emissions.

Significance of Impacts after Mitigation

Table 3.2-44 shows the reduction in Alternative 2 GHG emissions due to the implementation of **Mitigation Measures AQ-5, AQ-7a, AQ-12, and AQ-13**. This table indicates that mitigated Alternative 2 CO_2e emissions would increase relative to CEQA Baseline levels. After mitigation, Alternative 2 GHG impacts would remain significant under CEQA. Although not assessed for this analysis, implementation of **Mitigation Measures AQ-4, AQ-6 through AQ-11, and AQ- 14 through AQ-128** would further reduce Project GHG emissions. Specifically, **Mitigation Measure AQ-24 (Mitigation for Indirect GHG Emissions)** will require the terminal operator to use green commodities to offset carbon emissions associated with the terminal's electricity consumption (subject to limitations), which would result in additional reductions in the GHG emissions.

NEPA Impact Determination

Table 3.2-43 shows that annual operational CO_2e emissions from Alternative 2 would increase relative to the NEPA Baseline in 2010 and decrease thereafter. Because no NEPA significance threshold has been established, no determination of significance has been made for this impact.

Mitigation Measures

Although mitigation measures for GHG impacts are not required under NEPA, **Mitigation Measures AQ-4 through AQ-28** would reduce GHG emissions under NEPA.

Significance of Impacts after Mitigation

Table 3.2-44 shows that operation of mitigated Alternative 2 would produce lower CO_2e emissions relative to NEPA Baseline levels for all Project years.

3.2.2.5 Alternative 3 – Landside Improvements Alternative

Alternative 3 would redevelop existing terminal areas on Piers E and F and convert underutilized land north of the Gerald Desmond Bridge and Ocean Boulevard within the Project site to a container yard. No in-water activities, including dredging, filling Slip 1 and the East Basin, new wharf construction, wharf upgrades, or channel and berth deepening would occur.

Alternative 3 operations include the adoption of all applicable air regulations, CAAP measures, and mitigation measures (**Mitigation Measures AQ-4 through AQ-11**) discussed and proposed for Alternative 1. Therefore, no additional feasible mitigation measures are available to further reduce operational air quality impacts from this alternative. As a result, the impact analysis for operations of Alternative 3 does not include a mitigation analysis. However, mitigations were applied and assessed for proposed construction activities under Alternative 3.

Since Alternative 3 is equal to the NEPA Baseline, NEPA impacts from this Alternative are zero.

The same changes made to the Draft EIS/EIR air quality assumptions that were used in the Final EIS/EIR air quality analysis for Alternative 1, as described above, were also applied to Alternative 3. Thus, they are not repeated below. The regulations/CAAP measures assumed for Alternative 3 operational scenario are presented in Table 3.2-11 and for mitigated Alternative 3 are the same as for mitigated Alternatives 1 and 2.

Table 3.2-65 provides a comparison of the projected annual average daily and peak daily Alternative 3 CEQA emissions increments in the Draft EIS/EIR (Tables 3.2-46 and 3.2-47) and the Final EIS/EIR (Tables 3.2-36 and 3.2-37). Also noted are any differences in significance determinations between the Draft EIS/EIR and Final EIS/EIR with regard to the mitigated average and peak daily CEQA emissions increments. Importantly, these revisions did not result in any new significant impacts that were not identified in the Draft EIS/EIR for Alternative 3. Although Table 6.2-65 shows increases in emissions that were presented in the Draft EIS/EIR for some of the pollutants, the increases in the CEQA increment values are from the relatively large negative CEQA increments in the Draft EIS/EIR to somewhat large negative CEQA increments in the Final EIS/EIR. The revised CEQA increment values all remain well below significance thresholds for all pollutants.

Changes to emissions in the mitigated Alternative 3 scenario from the Draft EIS/EIR to the Final EIS/EIR account for a slight increase in the maximum CEQA increments for the residential, occupational and sensitive receptor sets. All maximum CEQA increments for the mitigated Alternative 2 scenario remain negative and risk values do not exceed the significance criterion of 10 in a million. Maximum NEPA increments for the Mitigated Alternative 2 scenario also see changes by comparison to the Draft EIS/EIR. The most significant change is to the maximum NEPA occupational increment decreasing from 16 in one million in the Draft EIS/EIR (Table 3.2-39) to eight in one million in the Final EIS/EIR (Table 3.2-41), which does not exceed the significance criterion. The decrease in the NEPA increment is attributed to the reduction in TAC emissions from new control and mitigation measures, including OGV switching to 1.5 percent sulfur fuel in 2010 and RTGs being replaced by electric RMG in 2020. There were no differences in the CEQA increment chronic and acute health impact results presented in the Final EIS/EIR and the Draft EIS/EIR.

Construction Impacts

Impact AQ-1: Alternative 3 construction would produce emissions that exceed SCAQMD emission significance thresholds.

Table 3.2-45 presents estimates of the unmitigated daily air emissions that would occur during each phase/stage of construction for Alternative 3. To determine the significance of emissions based on criterion AQ-1, the analysis included a review of the Alternative 3 construction schedule to determine a peak daily period of activity and resulting emissions for comparison to the SCAQMD daily emission thresholds.

<u>CEQA Impact Determination</u>

As shown in Table 3.2-45, during a peak day of activity, Alternative 3 construction would produce emissions that exceed the SCAQMD NO_x, PM_{10}, and $PM_{2.5}$ emission thresholds. Therefore, these would represent significant air quality impacts under CEQA. The main source of combustive emissions would occur from construction equipment associated with the Seaside Railyard area redevelopment, new container yard construction, and new terminal building construction. With regard to PM_{10} and $PM_{2.5}$ emissions, the overwhelming majority of the emissions would occur in the form of fugitive dust.

Mitigation Measures

Mitigation Measure AQ-1 would be applied to reduce significant levels of PM_{10}/$PM_{2.5}$ emissions. Since the analysis assumes as part of the Project description that all construction off-road equipment would meet Tier 3 standards, few feasible mitigation measures are available to further reduce combustive emissions from proposed sources. Although not quantified in the analysis, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** (described above under the proposed Project) would further reduce combustive emissions from proposed construction.

Significance of Impacts after Mitigation

Table 3.2-45 shows that implementation of **Mitigation Measure AQ-1** would substantially reduce emissions of PM_{10} and $PM_{2.5}$. However, mitigated construction emissions under CEQA would exceed the NO_x, PM_{10}, and $PM_{2.5}$ SCAQMD emission significance thresholds. As a result, these emissions would remain significant under CEQA.

<u>NEPA Impact Determination</u>

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-2: Alternative 3 construction would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate the ambient offsite impacts of Alternative 3 construction emissions. The analysis focused on a peak day of emissions that would occur from onsite activities and consistent with the methods used to estimate ambient construction impacts from Alternative 1. Appendix A-2 contains documentation of the Alternative 3 construction emissions included in the dispersion modeling analysis.

Peak day emissions of CO and NO_2 would occur during the Seaside Railyard area redevelopment, new container yard construction, and new terminal building construction. Table 3.2-46 presents the maximum ambient offsite impacts estimated for unmitigated Alternative 3 construction activities.

<u>CEQA Impact Determination</u>

Table 3.2-46 presents the maximum ambient offsite impacts estimated for unmitigated Alternative 3 construction activities. The data in Table 3.2-44 show that the unmitigated maximum offsite 24-hour PM_{10} incremental impact of 34.5 $\mu g/m^3$ would exceed the SCAQMD threshold of 10.4 $\mu g/m^3$. All other pollutant impacts would remain below significance levels.

Mitigation Measures

Implementation of **Mitigation Measure AQ-1** would reduce emissions of fugitive dust (PM_{10} and $PM_{2.5}$) during construction of Alternative 3. Although not assessed, **Mitigation Measures AQ-2, AQ-2a, AQ-2b, AQ-3, and AQ-3a** would further reduce combustive emissions and their resulting ambient impacts from proposed construction.

Significance of Impacts after Mitigation

Table 3.2-47 presents the maximum ambient offsite impacts estimated for mitigated Alternative 3 construction activities. The data in Table 3.2-47 show that the mitigated maximum offsite 24-hour PM_{10} incremental impact of 13.6 $\mu g/m^3$ would exceed the SCAQMD threshold of 10.4 $\mu g/m^3$. As a result, mitigated emissions from Alternative 3 construction would produce significant ambient 24-hour PM_{10} impacts under CEQA. All other pollutant impacts would remain below significance levels.

<u>NEPA Impact Determination</u>

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-3: Alternative 3 would result in operational emissions that would not exceed SCAQMD thresholds of significance.

Tables 3.2-48 and 3.2-49 present estimates of the annual average and peak daily air emissions that would occur from operation of Alternative 3 for milestone years 2010, 2015, 2020, and 2030.

CEQA Impact Determination

CEQA impacts for average daily emissions, which are presented in the "Net Change from 2005 CEQA Baseline" rows in Table 3.2-48, show that in all future years, Alternative 3 would produce lower operational emissions compared to the CEQA Baseline levels in 2005. This is the case, as the unmitigated Alternative 3 would adopt all applicable air regulations and CAAP measures, which would substantially lower emission rates from vehicle fleets associated with Alternative 3, compared to 2005 existing conditions. These lower emission rates would offset throughput increases and activities associated with Alternative 3. As a result, Alternative 3 would not exceed any SCAQMD daily emission threshold, and it would produce less than significant average daily emissions under CEQA.

The data in Table 3.2-49 show that Alternative 3 would produce lower peak daily operational emissions compared to the CEQA Baseline peak daily emissions in 2005. As a result, Alternative 3 would produce less than significant peak daily emissions under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required. The analysis of Alternative 3 daily emissions includes implementation of **Mitigation Measures AQ-4 through AQ-8**. Although not quantified in this analysis, **Mitigation Measures AQ-9 through AQ-11, AQ-25, and AQ-26** would further reduce combustive emissions from Project operations.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-4: Alternative 3 operations would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate ambient offsite impacts of the Alternative 3 operational emissions. The analysis focused on year 2010, representing the time period when this Alternative would generate the highest amount of emissions within and adjacent to the Middle Harbor container terminal (i.e., the ship docking and hoteling, terminal equipment, on-road trucks, and trains), which would produce the highest ambient impacts in the Port and onshore regions for any Project year. The analysis was consistent with the methods used to estimate ambient construction impacts from Alternatives 1 and 2. Appendix A-2 includes a discussion of the Alternative 3 operational emissions included in the dispersion modeling analysis.

CEQA Impact Determination

Table 3.2-50 presents the projected maximum ambient offsite impacts for unmitigated Alternative 3 operations. These data show that the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient thresholds. As a result, unmitigated emissions from Alternative 3 operations would contribute to significant levels of one-hour and annual NO_2 under CEQA. All other pollutant impacts would remain below significant levels.

Mitigation Measures

The unmitigated Alternative 3 would adopt all applicable air regulations, CAAP measures, and mitigation measures discussed and proposed for Alternative 1. Therefore, no additional feasible mitigation measures are available that would further reduce NO_2 impacts to below significance.

Significance of Impacts after Mitigation

Ambient one-hour and annual NO_2 impacts from unmitigated Alternative 3 operations would remain significant under CEQA.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-5: Alternative 3 would not create objectionable odors to sensitive receptors.

Alternative 3 operational activities would increase air pollutants due to the combustion of diesel fuels. Some individuals may sense that diesel combustion emissions are objectionable in nature, although quantifying the odorous impacts of these emissions to the public is difficult. However, the distance between proposed Alternative 3 emission sources within the terminal and the nearest residents (0.4 miles) would be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels.

CEQA Impact Determination

The data in Tables 3.2-48 and 3.2-49 show that in all future years, unmitigated operations from Alternative 3 would produce lower diesel combustion products and associated odors compared to CEQA Baseline levels. As a result, Alternative 3 operations would produce less than significant odor impacts under CEQA.

Mitigation Measures

As impacts to air quality would be less than significant, no mitigation is required. However, the unmitigated Alternative 3 scenario includes implementation of **Mitigation Measures AQ-4 through AQ-11**, **AQ-25, and AQ-26,** which would reduce operational emissions and resulting odor impacts.

Significance of Impacts after Mitigation

Impacts to air quality would be less than significant.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-6: Alternative 3 would not expose receptors to significant levels of TACs.

An analysis to evaluate public health impacts associated with Alternative 3 construction and operational emissions was conducted using the same methods specified for the Alternative 1 HRA.

There are no changes to emissions from the Draft EIS/EIR to the Final EIS/EIR for the Alternative 3 construction or operations, therefore there are no changes to the maximum CEQA increments for the residential, occupational and sensitive receptor values.

Table 3.2-51 presents estimates of the maximum cancer risk and non-cancer (acute and chronic) HHI increments associated with Alternative 3. The values presented for each receptor type correspond to the receptor with the maximum increment. The cancer risk and non-cancer HHI increments at all other receptors within the modeling domain would be less than those shown in Table 3.2-51.

Figures A-3-22 and A-3.23 in Appendix A-3 show the distribution of predicted residential cancer risks within the modeling domain for: 1) the Alternative 3, and 2) the mitigated CEQA increment (mitigated Alternative 3 minus CEQA Baseline).

CEQA Impact Determination

Table 3.2-51 shows that the maximum CEQA increment from Alternative 3 for residential cancer risk is predicted to be negative five in one million (-5×10^{-6}). This cancer risk value is less than the significance criterion (10×10^{-6} risk), and, therefore, would produce a less than significant impact under CEQA. This cancer risk value would occur at residences on the corner of Skyline Drive and East Panorama drive, approximately one mile south of Interstate 405.

The maximum CEQA increment for occupational cancer risk is predicted to be negative two in a million (-2×10^{-6}). This cancer risk value is less than the significance criterion (10×10^{-6} risk), and, therefore, would produce a less than significant impact under CEQA. This cancer risk value would occur in the industrial area on Terminal Island at the South Eastern corner of Pier A.

The maximum CEQA increment for cancer risk at a sensitive receptor is predicted to be negative three in a million (-3×10^{-6}). This cancer risk value is less than the significance criterion (10×10^{-6} risk), and therefore would produce a less than significant impact under CEQA. This cancer risk value would occur at the Cleveland Elementary School at 4760 Hackett Avenue in Lakewood. This risk value was conservatively modeled with 70-year residential exposure assumptions.

Table 3.2-51 shows that the maximum CEQA increments for the non-cancer chronic and acute health hazard indices would be less than one at all receptors. Therefore, the non-cancer chronic and acute health impacts associated with Alternative 3 would be less than significant under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant under CEQA, no mitigation is required. However, this HRA also presents an evaluation of how **Mitigation Measures AQ-4 through AQ-8** would reduce cancer risks from Alternative 3. Although not quantified in this analysis, implementation of **Mitigation Measures AQ-9** through **AQ-11, AQ-25, and AQ-26** would also reduce emissions and associated health impacts from Alternative 3.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Based on a comparison of the PM emissions between Alternative 3 and the proposed Project (Alternative 1), no significant changes to morbidity or mortality would be expected if Alternative 3 is implemented, in comparison to Alternative 1.

Impact AQ-7: Alternative 3 would not conflict with or obstruct implementation of the applicable AQMP.

Operation of Alternative 3 would produce emissions of nonattainment pollutants primarily from diesel-powered sources. The attainment strategies in the 2007 AQMP plan include mobile source control measures and clean fuel programs. Alternative 3 operations would have to comply with these control measures which will be implemented in SCAQMD rules and regulations. Thus, Alternative 3 would comply with these regulatory requirements which are designed to implement the 2007 AQMP.

The POLB provides SCAG with Port-wide cargo forecasts that are used to simulate growth scenarios in the AQMP and the attainment demonstrations in the AQMP include emission estimates for future growth at the Port. Since one objective of the AQMP is to improve the flow of goods at the Ports, Alternative 3 and its associated control measures would work in concert to implement the 2007 AQMP. Furthermore, adoption of existing regulations and CAAP measures would reduce emissions from the Alternative in comparison to the CEQA Baseline (Table 3.2-16). As a result, Alternative 3 would promote the objectives of the 2007 AQMP.

CEQA Impact Determination

Alternative 3 would not conflict with or obstruct implementation of the 2007 AQMP. Therefore, with regard to **Impact AQ-7**, impacts from Alternative 3 would be less than significant under CEQA.

Mitigation Measures

As impacts to air quality would be less than significant, no mitigation is required. However, **Mitigation Measures AQ-4 through AQ-11, AQ-25, and AQ-26**, which are proposed for adoption into Alternative 3, would further reduce operational emissions and associated air quality impacts.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

Impact AQ-8: The proposed Alternative 3 would produce GHG emissions that would exceed the CEQA threshold.

GHG Emissions from Alternative 3 Construction

Table 3.2-52 summarizes the GHG emissions generated from each phase/stage of Alternative 3 construction. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

GHG Emissions from Alternative 3 Operations

Table 3.2-53 summarizes the annual GHG emissions that would occur within California from operation of Alternative 3. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants. The data in Table 3.2-53 show the reduction in Alternative 3 GHG emissions due to the implementation of **Mitigation Measures AQ-5, 7a, AQ-12, and AQ-13**. These are the only proposed measures that can be readily quantified for GHG emission reductions. However, implementation of **Mitigation Measures AQ-14** through **AQ-28** would further reduce Alternative 3 GHG emissions.

The changes in mitigated operational GHG emissions for Alternative 3 from the Draft EIS/EIR to the Final EIS/EIR are to a large extent due to significant revisions to truck VMT estimates and to a lesser extent to revisions in the commuter VMT estimates used in the Final EIS/EIR GHG calculation, and the impacts of the various mitigation measures described above that included in Alternative 3.

As described in Section 3.2.1.2, it is estimated that airborne emissions of black carbon contribute to global warming, due to its ability to warm the atmosphere and melt snow packs and polar ice if deposited onto these surfaces. Black carbon is a component of DPM emissions generated by Alternative 3. Review of Table 3.2-48 shows that the mitigated Alternative 3 would produce lower operational emissions of DPM, and therefore black carbon, in all future years compared to the CEQA Baseline. Therefore, this reduction in DPM by the Alternative would represent an incremental benefit to climate change effects produced by black carbon.

CEQA Impact Determination

Table 3.2-52 shows that annual CO_2e emissions from construction would increase relative to the CEQA Baseline.

Table 3.2-53 shows that annual CO_2e emissions from the operation of Alternative 3 would increase relative to the CEQA Baseline in all Project years. These increases are considered a significant impact under CEQA.

Mitigation Measures

Measures that reduce electricity consumption or fossil fuel usage from Project emission sources would reduce GHG emissions from Alternative 3. Since unmitigated Alternative 3 would adopt all applicable air regulations and CAAP measures, there are no additional feasible mitigation measures that could be applied to reduce GHG emissions to below significance.

Significance of Impacts after Mitigation

Alternative 3 GHG impacts would remain significant under CEQA during proposed construction and operations.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on air quality would occur.

3.2.2.6 Alternative 4 – No Project Alternative

The No Project Alternative would not include construction of upland site improvements, rail improvements, the Pier E Substation, or in-water activities (i.e., dredging, filling of Slip 1 and the East Basin, or new wharf construction). However, the existing terminal would experience increases in cargo forecasted for this alternative. Operational impacts associated with Alternative 4 would occur from the same types of activities and sources as those defined for the CEQA Baseline.

Impact AQ-1: Alternative 4 would not produce construction emissions that exceed a SCAQMD emission significance threshold.

The No Project Alternative would not include any construction activities.

CEQA Impact Determination

Alternative 4 would not produce any construction air quality impacts under CEQA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

NEPA Impact Determination

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-2: Alternative 4 would not produce offsite ambient air pollutant concentrations

during construction that exceed a SCAQMD threshold of significance.

The No Project Alternative would not include any construction activities.

CEQA Impact Determination

Alternative 4 would not produce any construction air quality impacts under CEQA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

NEPA Impact Determination

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-3: Alternative 4 would not result in operational emissions that exceed a SCAQMD threshold of significance.

Tables 3.2-54 and 3.2-55 present estimates of the annual average and peak daily air emissions that would occur from the operation of Alternative 4 for milestone years 2010, 2015, 2020, and 2030, respectively.

CEQA Impact Determination

CEQA impacts from average daily emissions, which are presented in the "Net Change from 2005 CEQA Baseline" rows in Table 3.2-54, show that in all future years Alternative 4 would produce lower operational emissions compared to the CEQA Baseline levels in 2005. As a result, Alternative 4 would not exceed any SCAQMD daily emission threshold and it would produce less than significant average daily emissions under CEQA.

The data in Table 3.2-55 show that Alternative 4 would produce lower peak daily operational emissions compared to the CEQA Baseline average daily emissions (2005) in all future years. As a result, Alternative 4 would produce less than significant peak daily emissions under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

NEPA Impact Determination

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-4: Alternative 4 operations would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

A dispersion modeling analysis using the EPA AERMOD program was performed to estimate ambient offsite impacts of Alternative 4 operational emissions. The analysis focused on year 2010, since, during that year, Alternative 4 would generate the highest amount of emissions within and adjacent to the Middle Harbor container terminal, which would produce the highest ambient impacts in the Port and onshore regions for any Project year. Appendix A-2 includes a discussion of the Alternative 4 operational emissions dispersion modeling analysis.

CEQA Impact Determination

Table 3.2-56 presents the projected maximum ambient offsite impacts for Alternative 4 operations. These data show that the maximum total NO_2 impacts would exceed the one-hour and annual SCAQMD ambient significance thresholds. As a result, unmitigated emissions from Alternative 4 operations would contribute to significant levels of one-hour and annual NO_2 under CEQA. All other pollutant impacts would remain below significant levels.

Mitigation Measures

Mitigation measures were not identified for the No Project Alternative, as this alternative would not require approvals for new uses.

Significance of Impacts after Mitigation

Impacts on air quality would be significant.

NEPA Impact Determination

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-5: Alternative 4 would not create objectionable odors to sensitive receptors.

Alternative 4 operational activities would increase air pollutants due to the combustion of diesel fuels. Some individuals may sense that diesel combustion emissions are objectionable in nature, although quantifying the odorous impacts of these emissions to the public is difficult. However, the distance between Alternative 4 emission sources within the terminal and the nearest residents (0.4 miles) would be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels.

<u>CEQA Impact Determination</u>

The data in Tables 3.2-54 and 3.2-55 show that in all future years, unmitigated operations from Alternative 4 would produce lower diesel combustion products and associated odors compared to CEQA Baseline levels. As a result, Alternative 4 operations would produce less than significant odor impacts under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-6: Alternative 4 would not expose receptors to significant levels of TACs.

Minor changes to emissions in Alternative 4 from the Draft EIS/EIR to the Final EIS/EIR account for minor changes to the maximum CEQA increments for the residential, occupational and sensitive receptor sets. All maximum CEQA increments for the Alternative 4 remain negative and risk values do not exceed the cancer risk significance criteria of 10 in one million.

An analysis to evaluate public health impacts associated with Alternative 4 operational emissions was conducted using the same methods specified for the Alternative 1 HRA. Table 3.2-57 presents estimates of the maximum cancer risk and non-cancer (chronic and acute) HHI increments associated with Alternative 4. The values for each receptor type correspond to the receptor with the maximum increment. The cancer risk and non-cancer (chronic and acute) HHI increments at all other receptors within the modeling domain would be less than those shown in Table 3.2-57. Estimates of the incremental cancer burden associated with Alternative 4 are also presented in this table.

Figures A-3-24 and A-3-25 in Appendix A-3 show the distribution of predicted residential cancer risks within the modeling domain for (1) Alternative 4 and (2) CEQA increment (Alternative 4 minus CEQA Baseline).

<u>CEQA Impact Determination</u>

Table 3.2-57 shows that the maximum CEQA increment for cancer risks from Alternative 4 for residential, occupational, and sensitive receptors would be negative (i.e., less than zero for all receptor types). Therefore, the cancer risk impacts associated with Alternative 4 would be less than significant under CEQA.

Table 3.2-57 shows that the maximum CEQA increments for the non-cancer chronic and acute

HHI from Alternative 4 would be less than one at all receptors. Therefore, the non-cancer chronic and acute health impacts associated with Alternative 4 would be less than significant under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Based on a comparison of the PM emissions between Alternative 4 and the proposed Project, no significant changes to morbidity or mortality would be expected if Alternative 4 is implemented.

Impact AQ-7: Alternative 4 would not conflict with or obstruct implementation of the applicable AQMP.

Similar to the proposed Project, Alternative 4 would comply with the 2007 AQMP emission reduction measures that are designed to bring the SCAB into attainment of the national and state ambient air quality standards and the SCAQMD rules and regulations, which are used to regulate sources of air pollution in the SCAB. Therefore, compliance with these requirements would ensure that Alternative 4 would not obstruct implementation of the AQMP.

<u>CEQA Impact Determination</u>

Alternative 4 would not conflict with or obstruct implementation of the AQMP. Therefore, impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on air quality would be less than significant; no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would be less than significant.

<u>NEPA Impact Determination</u>

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Impact AQ-8: The proposed Alternative 4 would produce GHG emissions that would exceed CEQA thresholds.

GHG Emissions from Alternative 4 Construction

There are no construction activities. Therefore, there are no GHG emissions associated with construction activities from Alternative 4.

GHG Emissions from Alternative 4 Operations

Table 3.2-58 summarizes the annual unmitigated GHG emissions that would occur within California from the operation of Alternative 4. Sources considered in these emission calculations are the same as those analyzed for criteria pollutants.

<u>CEQA Impact Determination</u>

Table 3.2-58 shows that annual CO_2e emissions would increase relative to the CEQA Baseline in all Project years. These increases are considered a significant impact under CEQA.

As described in Section 3.2.1.2, it is estimated that airborne emissions of black carbon contribute to global warming, due to its ability to warm the atmosphere and melt snow packs and polar ice if deposited onto these surfaces. Black carbon is a component of DPM emissions generated by Alternative 4. Review of Table 3.2-54 shows that Alternative 4 would produce lower operational emissions of DPM, and therefore black carbon, in all future years compared to the CEQA Baseline. Therefore, this reduction in DPM by the Alternative would represent an incremental benefit to climate change effects produced by black carbon.

Mitigation Measures

Mitigation measures were not identified for the No Project Alternative, as Alternative 4 would not require approvals for new uses.

Significance of Impacts after Mitigation

Alternative 4 GHG impacts would remain significant in all Project years under CEQA.

<u>NEPA Impact Determination</u>

Since the No Project Alternative would not include any federal action, Alternative 4 would not produce any air quality impacts under NEPA.

Mitigation Measures

As impacts on air quality would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on air quality would not occur.

Alternative 4 vs. Alternative 1 Impacts

Daily and annual emissions from Alternative 4 would be less than those estimated for the unmitigated Alternative 1 scenario. This is due to lower throughput levels associated with Alternative 4 compared to Alternative 1. Both scenarios would operate with the same air emission regulations and controls, although Alternative 1 would operate with more efficient cargo handling systems. Daily and annual emissions from Alternative 4 also would be less than those estimated for the mitigated Alternative 1 scenario except for year 2010, even though this later scenario would operate with more stringent air emission regulations and controls. Correspondingly, ambient impacts analyzed for Alternative 4 would be less than those estimated for the unmitigated or mitigated Alternative 1 scenarios, except for year 2010 under the mitigated Alternative 1 scenario.

3.2.3 Cumulative Impacts

The following discussion evaluates whether air quality impacts of the proposed Project would be cumulatively significant within the context of impacts caused by other past, present, or reasonably foreseeable future projects in the geographic location of the proposed Project. The region of analysis for the Project's cumulative effects on air quality is:

(1) The SCAB for criteria pollutants; although, the highest criteria pollutant impacts from the Project would occur within the communities adjacent to the proposed Project;

(2) For health risk analysis purposes, the area of influence includes the Project's ZOI, which is defined as the area within the one-in-a-million isopleths of health risk increment and/or a non-cancer acute or chronic HHI of 1.0; and

(3) Globally for GHG; although from a regional basis the focus is the state of California.

The SCAQMD has recently requested from EPA a bump-up to the eight-hour O_3 attainment status of the SCAB from "severe-17" to "extreme" nonattainment. The SCAB is also classified as "serious" nonattainment for PM_{10} and as nonattainment for $PM_{2.5}$ federal standards. Moreover, the SCAB is classified as "extreme" nonattainment for the State standards O_3 and as nonattainment for the State PM_{10} standard. Thus, any increase in these pollutants' emissions would be significant.

Cumulative analysis of air quality impacts uses projections from the SCAB 2007 AQMP and the MATES-II (SCAQMD 2000) and MATES-III studies (SCAQMD 2008). Additionally, the cumulative impact analysis considers other projects proposed within the area that would have the potential to contribute to cumulatively considerable impacts, and includes approved or pending actions identified in Table 2.1-1 (refer to Figure 2.1-1 for locations of the various projects). Cumulative projects considered in the analysis include the Piers G & J Terminal Redevelopment Project, Pier S Marine Terminal Project, Gerald Desmond Bridge Replacement Project, Shoreline Gateway Project, Berths 136-147 Marine Terminal, Berths 97-109 Container Terminal Project, Channel Deepening Project, Pacific Los Angeles Marine Terminal, San Pedro Waterfront Enhancement Project, Berth 206-209 Interim Container Terminal Reuse Project, Port of Los Angeles Charter School and Port Police headquarters, Pan-Pacific Cannery Complex Demolition Project, Pier 300 APL Containers Terminal Expansion Project, Southern California International Gateway Project, Union Pacific Intermodal Container Transfer Facility Modernization Project, Pacific Corridors Redevelopment Project, Schuler Heim Bridge Replacement, SR Expressway Project, and the I-710 Corridor Project. These projects include construction and/or operational activities that would occur concurrently, as least in part, with the Project; are within the Project's region; and would potentially contribute cumulatively to the Project's air quality impacts. Key projects in this group that would have the potential to combine with Project emissions and produce the greatest cumulative impacts are described in additional detail below. The descriptions of air quality impacts from these future projects were obtained from publicly available information, such as NEPA/CEQA documentation.

Berth 206-209 Interim Container Terminal Reuse Project

The Berth 206-209 project is located on Terminal Island in the Port of Los Angeles (Figure 2.1-1) and represents a 5-year interim reuse of the 86-acre former Matson/SSAT Container Terminal. As documented in the Re-circulated EIR (2005), relatively minor terminal improvements are involved, including building and facilities demolition and upgrades, installation of Alternative Maritime Power (AMP) equipment and reefer plugs, and crane replacement. Additional long-term options to redevelop Berth 206-209 are being explored by POLA, but no plans of schedules have been adopted. Following mitigation, the only significant and unavoidable impacts to air quality as a result of the project would include construction-related emissions of NO_x and operational emissions of SO_x. It was concluded that there are no feasible additional mitigation measures available to reduce these impacts to less than significant levels. No analysis was conducted in the EIR for potential effects to GHG.

Berth 97-109 Container Terminal Project

The Berth 97-109 ("China Shipping") container terminal project is located within the West Basin portion of the POLA (Figure 2.1-1) and includes constructing a new container terminal for China Shipping Lines. As stated in the Recirculated Draft EIS/EIR (2008), the proposed new container terminal would include 142 acres of backlands to support terminal operations and a total of 2,500 feet of new wharf along Berths 100 and 102. The terminal would be developed by LAHD in three phases of construction: Phase I (completed in 2003 with operations starting in 2004), Phase II (to be completed in 2011), and Phase III (to be completed in 2012). The terminal would operate over a 40-year lease (2005 to 2045); however, the terminal would operate at maximum capacity by 2030. Significant impacts on air quality after mitigation include construction-related emissions of VOC, CO, NO_X, SO_X, PM_{10}, $PM_{2.5}$, offsite ambient air pollutant concentrations exceeding the one-hour NO_2 and 24-hour PM_{10} thresholds; operational emissions of VOC, CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$, offsite ambient air pollutant concentrations exceeding the one-hour and annual NO_2 and 24-hour PM_{10}/$PM_{2.5}$ thresholds; sensitive receptor exposed to TACs (i.e., cancer risk and non-cancer effects); and GHG emissions. The Re-circulated Draft EIS/EIR concluded that there are no feasible mitigation measures available to reduce these impacts to less than significant.

Berths 136-147 Marine Terminal Project

The Berths 136-147 ("TraPac") marine terminal project includes constructing an expanded container terminal at Berths 136-147 in the West Basin of Los Angeles Harbor (Figure 2.1-1). The project would modernize the container terminal at Berths 136-147, upgrade existing wharf facilities, and install a buffer area between the terminal and the community. The existing 176-acre project site would be increased to 243 acres, including 67 acres of newly created land. The project includes a 30-year lease and would involve two phases of construction: Phase I from 2008-2015 and Phase II from 2015- 2025. Significant impacts on air quality after mitigation would include construction-related emissions of VOC, NO_X, SO_X, PM_{10}, $PM_{2.5}$, offsite ambient air pollutant concentrations exceeding the one-hour NO_2 and 24-hour PM_{10} and $PM_{2.5}$ thresholds; operational emissions of VOC, CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$, offsite ambient air pollutant concentrations exceeding the one-hour and annual NO_2 and 24-hour PM_{10}/$PM_{2.5}$ thresholds; and GHG emissions. The Final EIS/EIR concluded that there are no feasible mitigation measures available to reduce these impacts to less than significant.

Piers G & J Terminal Redevelopment Project

The Piers G & J terminal redevelopment project would develop a 315-acre marine terminal within the Southeast Basin of the POLB (Figure 2.1-1). The project would consolidate existing terminals on Piers G and J and several surrounding parcels and includes demolition of existing facilities, new landfill, dredging, and construction of a new wharf and terminal facilities. The existing 262-acre project site would be increased to 315 acres, including 53.3 acres of newly created land. The terminal would be constructed in four phases over an 11-year period. Significant impacts on air quality after mitigation would include construction-related emissions of VOC, NO_X, SO_X, PM_{10}, and $PM_{2.5}$; and operational emissions of NO_X. The Final EIR concluded that there are no feasible mitigation measures available to reduce these impacts to less than significant. No analysis was conducted in the EIR for potential effects associated with GHG.

The projects described above would add or subtract to the cumulative air quality impacts from the Project. However, the net change to local and regional air quality would not be the sum of each project's impacts as these are not directly additive. For example, the ambient air quality impacts analysis for some of the projects concluded peak concentrations at specific locations. However, the peak impact location for one project would not coincide with the location predicted from another project. As a result, quantification of net cumulative impacts was not conducted nor would such an approach be scientifically valid. Rather, a description of air quality-related impacts from each project establishes the context in which a proposed project's air quality-related impacts can be considered in a cumulative setting.

Union Pacific Intermodal Container Transfer Facility Modernization Project

This project was suggested for review by a commenter and is evaluated in the Final EIS/EIR to address that comment.

The Intermodal Container Transfer Facility Modernization Project (ICTF Project) would include the construction of additional working rail tracks, the construction of a new gate facility, the improvement of existing gate facility, and additional parking. The proposed project would more than double the throughput capacity of the ICTF from 725,000 to 1.5 million containers per year. The project would incorporate a number of environmental improvements, including (1) the replacement of diesel-fueled cranes and yard hostlers with electric overhead cranes and non-diesel-fueled hostlers, and (2) the replacement of existing locomotives with ultra-low emission locomotives. The ICTF project, when completed in 2016, would reduce diesel particulate matter (DPM) emissions by approximately 74 percent and NO_x emissions by more than 55 percent from 2005 levels. Emissions of CO, ROG, oxides of sulfur (SO_x), and GHG would also be reduced by the ICTF Project.

Although there may likely be an increase in local emissions during the project construction period, overall the project is expected to significantly lower cumulative air quality impacts during the operational phase of this ICTF Modernization project.

I-710 Corridor Project

This project was suggested for review by a commenter and is evaluated in the Final EIS/EIR to address that comment.

The California Department of Transportation (Caltrans), in coordination with the Los Angeles County Metropolitan Transportation Authority (Metro) is developing an EIR for the proposed I-710 corridor project. The project proposes to improve I-710 in Los Angeles County from Ocean Boulevard in the City of Long Beach to SR-60, a distance of 18 miles. The project review is at an early stage, as the draft EIR is scheduled for completion and release during the summer of 2010. The objectives of the proposed project are to develop transportation solutions to improve air quality and traffic safety and address corridor design deficiencies, projected traffic volumes, and projected economic activities related to goods movement. The air quality analysis will evaluate the project alternatives for current and projected emissions of air pollutants and GHG.

A total of six project alternatives are being considered in addition to the no-build alternative. All project alternatives are likely to show cumulative emission decreases in the final design year (2035) compared to the 2008 baseline due to 80-90 percent reduction in per-vehicle emissions. Some project alternatives may further reduce corridor emissions by reducing daily port truck trips.

Southern California International Gateway

The Southern California International Gateway (SCIG) is a new near-dock rail facility that would facilitate the movement of container freight in and out of the San Pedro Bay Ports by rail. The SCIG project would occur adjacent to the ICTF Project. Other project elements include the widening of an existing railroad bridge over the Dominquez Channel, the replacement of an existing railroad bridge over Sepulveda Blvd., additional track construction north of Sepulveda Blvd., and alterations to a Pacific Coast Highway interchange. A Notice of Preparation for an EIR has been released, but the project air quality analysis is not yet available. The analysis will evaluate emissions of criteria pollutants, air toxics including DPM, and GHG generated by each project alternative in comparison to baseline conditions. This project is anticipated to divert a substantial amount of truck traffic off nearby freeways, such as the I-710, and thereby reduce overall truck miles traveled and related air emissions in the region. Also, alternative non-diesel delivery systems for the movement of containers between the Ports and the proposed SCIG facility will be evaluated to reduce air emissions.

This project will likely result in an increase in local air emissions during the construction period, and could result in a cumulatively considerable net increase in air emissions at the site and in the immediate surrounding area during operations. However, there is also the potential for an overall reduction in air emissions through the diversion of truck traffic off freeways, and the possible use of non-diesel container delivery systems.

Criteria Pollutants

Due to its large population, substantial numbers of emission sources, and geographical/ meteorological conditions that inhibit atmospheric dispersion, the SCAB experiences degraded air quality. As stated in Section 3.2, the region presently does not attain the national and/or state ambient air quality standards for O_3, PM_{10}, and $PM_{2.5}$. These pollutant nonattainment conditions within the Project region are considered to be cumulatively significant. However, the *2007 AQMP* predicts attainment of all NAAQS within the SCAB, including $PM_{2.5}$ by 2014 and O_3 by 2024, although these predictions are speculative.

With regard to **Impacts AQ-1 and AQ-2,** peak daily Project construction activities would produce mitigated emissions that would exceed the SCAQMD peak daily emission thresholds for VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$ and one-hour NO_2 and 24-hour PM_{10} ambient thresholds.

Any activity that concurrently occurs in the vicinity of Project construction would add additional air emission burdens to these significant levels of Project emissions. As a result, mitigated emissions from Project construction would produce cumulatively considerable and unavoidable contributions to O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$ levels under NEPA and CEQA. Construction activities resulting from some of the projects listed above (e.g., Pier G & J Terminal Redevelopment Project; Berths 136-147 Marine Terminal, West basin Project; Berths 97-109 Container Terminal Project, West Basin; Channel Deepening Project; Berths 136-147 Marine Terminal; Berth 206-209 Interim Container Terminal Reuse Project; Pacific Los Angeles Marine Terminal; Port of Los Angeles Charter School and Port Police Headquarters Project; and San Pedro Waterfront Enhancement Project) would add to the emission levels and ambient concentrations around the Ports due to their overlapping construction schedule.

With regard to **Impact AQ-3,** the net change in average daily operational emissions between the mitigated Project and NEPA Baseline would exceed the (1) SCAQMD daily NO_x threshold for all milestone years, (2) SCAQMD daily ROG threshold in 2015 and thereafter, and (3) CO threshold in 2020 and thereafter. Additionally, in all future years, the net change in peak daily operational emissions between the mitigated Project and NEPA Baseline would exceed the SCAQMD daily thresholds for VOC, CO, NO_x, SO_2, and $PM_{2.5}$. Therefore, the Project would result in a cumulatively considerable and unavoidable contribution to criteria pollutant emissions during operations under NEPA. In all future years, the unmitigated Project would produce lower operational emissions compared to the CEQA Baseline levels in 2005. As a result, the Project would produce less than cumulatively considerable impacts for **Impact AQ-3** under CEQA.

Any activity that occurs concurrently in the vicinity of proposed Project terminal operations would add additional air emission burdens to these significant levels of Project emissions. As a result, daily emissions from mitigated Project operations would produce cumulatively considerable and unavoidable impacts to O_3, CO, SO2, and $PM_{2.5}$ levels under NEPA for all Project milestone years. Operational activities resulting from the projects listed above and in Table 2.1-1 (e.g., Pier G & J Terminal Redevelopment Project; Berths 136-147 Marine Terminal, West basin Project; Berths 97-109 Container Terminal Project, West Basin; Channel Deepening Project; Berths 136-147 Marine Terminal; Berth 206-209 Interim Container Terminal Reuse Project; Port of Los Angeles Charter School and Port Police Headquarters Project; and San Pedro Waterfront Enhancement Project) would add to the emission levels and ambient concentrations around the ports due to their overlapping schedules.

With regard to **Impact AQ-4,** mitigated Project operations would produce ambient impacts that would exceed the SCAQMD one-hour and annual NO_2 ambient thresholds under NEPA and CEQA. As a result, mitigated Project operations, in combination with existing and future projects, would produce cumulatively considerable and unavoidable contributions to ambient NO_2 levels under NEPA and CEQA. However, these impacts represent lower cumulative NO2 impacts compared to those produced from existing terminal operations in 2005.

With regard to **Impact AQ-5,** Project operational activities would generate air pollutants from the combustion of diesel fuels. Some individuals may sense that diesel combustion emissions are objectionable in nature, although quantifying the odorous impacts of these emissions to the public is difficult. Since the Port contains a large number of diesel emission sources and residents (sensitive receptors) adjacent to Port operations, odorous emissions in the Project region are cumulatively significant.

In future years, unmitigated Project operations would reduce diesel combustion products and associated odors compared to existing conditions. As a result, unmitigated Project operations would produce less than cumulatively considerable contributions to ambient odor levels under CEQA. In all future years, mitigated Project operations would increase diesel combustion products and associated odors compared to NEPA Baseline levels. As a result, mitigated Project operations would produce cumulatively considerable contributions to ambient odor levels under NEPA.

As stated in Section 3.2.1.3, the POLB and POLA are developing the San Pedro Bay Standards (SPBS), whose goals are to reduce the cumulative impacts of air pollutants and health risks from Ports operations. Based on the methodologies contained in the draft SPBS, the Project would be consistent with the proposed Emission Reduction Standard portion of the SPBS, as it would comply with (1) current regulatory requirements, (2) CAAP assumptions and applicable emission control measures, and (3) emissions control measures that exceed those required under the current CAAP. In other words, the Project would comply with the goal of the SPBS to reduce cumulative criteria pollutant impacts from Ports operations.

Toxic Air Contaminants

With regard to **Impact AQ-6,** the SCAQMD in their MATES-II and MATES-III (current draft) reports and the ARB in their *Diesel Particulate Matter Exposure Assessment Study for the Ports of Los Angeles and Long Beach* estimated that elevated levels of cancer risks due to operational emissions from the POLB and POLA occur within and in proximity to the two Ports (SCAQMD 2000 and 2008; ARB 2006). MATES-II estimated that cancer risk from TACs in the SCAB range from 1,120 be 1,740 in a million, with an average of 1,400 in a million (SCAQMD 2000). Based on data from the Long Beach air monitoring station, ambient risks for the Long Beach area are approximately 1,120 in a million. The draft MATES III study concludes that the population-weighted risk in the Basin dropped by 17 percent from 2000 levels. However, diesel particulates continue to dominate the risk from air toxics, accounting for 84 percent of the carcinogenic risk. The MATES-III Draft Report estimates the cancer risk from TACs at 1,000 to 2,000 in a million in the San Pedro and Wilmington areas. Regarding non-cancer effects, the ARB identifies that elevated levels of air pollution that can occur within the Ports region are associated with adverse health effects, including asthma, bronchitis, reduced lung function, and increased mortality and morbidity (ARB 2006d). Based on this information, the existing and future baseline airborne cancer and non-cancer conditions within the Project region are cumulatively significant.

The Port has approved Port-wide air pollution control measures through implementation of the CAAP. The CAAP is designed with the goal of reducing DPM emissions from truck activity near Port facilities by approximately 80 percent over the next five years.

Approval of this Project would initiate implementation of applicable CAAP measures through a future terminal lease agreement. Additionally, adoption of the SPBS will commit both Ports to revise the current CAAP with additional emission control measures.

It is beyond the scope of this CEQA/NEPA process to quantify Project cumulative health impacts, as this would require a dispersion modeling analysis that takes into consideration all sources of TACs within the Ports region. However, in developing the SPBS, the Ports, including the POLB, recognize the importance of ensuring that new projects are designed to be consistent with the CAAP as well as with other applicable regulations and that implementation of the project will allow for the Ports to meet their long-term health risk and emission reduction goals.

Upon completion of the San Pedro Bay Standards by the Ports of Long Beach and Los Angeles, data will be publically available that quantifies the cumulative health effects from existing and proposed emission sources within the San Pedro Bay Ports, including the Middle Harbor Project. These data are described in the Bay-wide HRA that was conducted as part of this process. The Bay-wide HRA evaluates emission scenarios for years 2014 and 2023 that include implementation of applicable CAAP measures to many of the Ports' CEQA projects, including many of those identified above. In place of a quantitative cumulative HRA, the following qualitatively describes cumulative health impacts that would occur from the effects of the Project in combination with cumulative projects.

Emissions of TACs from construction and operation of the mitigated Project would reduce cancer risks to all receptor types within the Project region compared to the CEQA Baseline. As a result, the mitigated Project would produce less than cumulatively considerable contributions to cancer effects under CEQA.

Emissions of TACs from construction and operation of the mitigated Project would reduce non-cancer health effects to all receptor types within the Project region compared to the CEQA Baseline, except for chronic non-cancer effects to occupational receptors. As a result, the mitigated Project would produce less than cumulatively considerable contributions to non-cancer effects under CEQA, except for chronic non-cancer effects to occupational receptors. The maximum Project chronic non-cancer effects to occupational receptors would not exceed the 1.0 HHI significance criterion. However, since the mitigated Project would increase chronic non-cancer effects in the Project region, it would produce a cumulatively considerable and unavoidable contribution of airborne non-cancer effects to occupational receptors under CEQA. These increased non-cancer effects could include asthma, bronchitis, reduced lung function, and increased mortality and morbidity.

Emissions of TACs from construction and operation of the mitigated Project would increase cancer risks to all receptor types within the Project region as compared to the NEPA Baseline. While these cancer risk increases would not exceed the significance criterion of 10 per million (10×10^{-6}), they would produce cumulatively considerable and unavoidable contributions to airborne cancer risks to all receptor types under NEPA.

Emissions of TACs from construction and operation of the mitigated Project would increase non-cancer health effects to all receptor types within the Project region compared to the NEPA Baseline. The maximum Project non-cancer effects to each receptor type would not exceed the 1.0 HHI significance criterion. However, since the mitigated Project would increase non-cancer effects in the Project region, it would produce a cumulatively considerable and unavoidable contribution to airborne non-cancer effects under NEPA. These increased non-cancer effects could include asthma, bronchitis, reduced lung function, and increased mortality and morbidity.

Since the Project would produce significant cumulative health impacts, to help address the cumulative impacts of the Middle Harbor Project, the Port will require this Project to fund the Schools and Related Sites Grant Program and Healthcare and Seniors' Facility Grant Program. This money will be used for mitigation projects and prevention programs for people sensitive to air pollutants, as well as certain noise mitigation projects. Projects/programs would be submitted to the Board of Harbor Commissioners by applicants for review and approval. The Grant Guidelines, adopted on March 23, 2009, establish: (1) the eligibility criteria for applicants and projects/ programs; (2) the ranking criteria for proposed projects/programs if proposal requests exceed available funding; and (3) review and approval procedures. Funding established by the approval of the Middle Harbor Project would enable the expeditious implementation of many cumulative impact mitigation projects and health-related prevention programs in the areas most directly affected by port area sources. These measures are designed to supplement source-reduction measures in the near term when cumulative impact are predicted to be highest.

Schools and Related Sites Grant Program: The guidelines for this program include exposure-mitigation projects and eligibility criteria designed to ensure that the exposure mitigation potential of all approved projects will be maximized. The air-related projects are based on programs promulgated and approved by the California Air Resources Board (ARB) and South Coast Air Quality Management District (SCAQMD), such as the Carl Moyer Program and the Air Quality Investment Program, respectively. These projects have been shown to result in either a decrease in particulate matter (and other criteria pollutant) emissions or a reduction in exposure to those pollutants. For example, in a pilot test HEPA filters were placed at a number of schools that had either no filters or less efficient filters. The SCAQMD measured a 70 to 90 percent decrease indoors of fine PM and DPM compared to only 10 to 20 percent reduction in PM and DPM in facilities without filters (Environ 2008). In addition, several vendors of DPM filters for retrofitted generators have verified reductions of 85 percent (ARB 2008c). Similarly, effective noise barriers can reduce traffic noise to within acceptable levels, or by five to ten dBA below projected levels without such barriers.

How the grant money will be used will depend on the mix of projects for which the Port receives funding applications. For example, under the Schools and Related Sites Grant Program, approximately $320,000 would pay for all of the following measures at one school: five stand-alone classroom HVAC units, 54 HEPA filters over five years, retrofitting of three existing school buses with diesel particulate matter (DPM) filters, 30 mature trees and/or shrubs between roadways and outside play yards, two electric lawn vacuums, one retrofitted emergency generator, and 68 window/door replacements. As noted in the Schools and Related Sites Guidelines, sixteen (16) Long Beach Unified School Districts (LBUSD) schools are in Zone 1, which has the greatest cumulative air quality impacts. If all the LBUSD schools within Zone 1 applied for the same group of projects listed above, the total cost would be $4.7 million, based on the type and the size of school (elementary, middle, or high school). While all schools, public or private, in Zones 1-3 are eligible to apply for funding pursuant to the guidelines, the 16 public schools located in Zone 1 provide a reasonable measure of what could be achieved (in terms of serving those most impacted, as determined through proximity to the Project, and serving the greatest number of students, as represented by the student population served by LBUSD). As another example, $5 million would cover the costs of 75 stand-alone HVAC units, 800 HEPA filters for five years, the retrofitting of 45 existing school buses with diesel particulate matter (DPM) filters, 450 mature trees and/or shrubs to be planted between roadways and outside play yards, 30 electric lawn vacuums, 15 retrofitted emergency generators and 1,000 window/door replacements. The Middle Harbor Project will provide one-time grant funding of $5 million towards these kinds of measures through the Schools and Related Sites Grant Program. As shown in the illustrative examples above, this would provide the means to reduce cumulative air and noise impacts in the near term (when emissions in the area are expected to be the greatest) for children at an appreciable number of schools and related facilities downwind and in the area of the San Pedro Bay ports.

Healthcare and Seniors' Facility Grant Program: This grant program would provide funding for direct exposure-mitigation projects, such as those described in the Schools and Related Sites Grant Program for healthcare and seniors' facilities, and testing, education, and outreach prevention measures/programs. Prevention measures identified in the Healthcare and Seniors' Facility Program are based on similar programs promulgated by The Children's Clinic, Long Beach Alliance for Children with Asthma, Orange County School Asthma Program, and the Chicago Mobile C.A.R.E. Foundation, which measures have been shown to result in a decrease in asthma-related effects. For example, the Chicago Mobile C.A.R.E. program has conducted asthma screening of about 45,000 low-income Chicago children between November 1999 and December 2008 serving 60 schools, with 5,000 children enrolled in the program, 25,000 patient visits occurring in the Asthma Vans, and hundreds of families utilizing the 24-hour direct physician phone service. They found that after three visits on the Asthma Vans, children's asthma-related emergency room visits and hospitalizations drop by approximately 50 percent (Mobile C.A.R.E Foundation 2008).

Per-facility costs associated with direct exposure mitigation measures (as described for schools above) for healthcare and seniors' facilities may be less given the typical size of common rooms at senior centers, retirement communities, and convalescent homes. For example, approximately $54,000 would pay for the addition of four stand alone HVAC units and HEPA filters in common areas, and the retrofit of one diesel generator at one senior center. In Zone 1 (the closest zone to the Port boundaries), there are an estimated 21 senior centers, retirement communities, etc. within one mile of the Port's boundaries. If all of these centers applied for funding for this group of projects, the total cost would be approximately $1.1 million. The Children's Clinic, which operates a number of clinics near the Port estimates annual health education and outreach programs to cost on average $500,000 per year, not including administrative costs, while the Chicago Mobile C.A.R.E. program spends on average $1.4 million on asthma van operating costs per year. The proposed Project would provide one-time grant funding of $5 million for the Healthcare and Seniors' Facility Grant Program. This would, for example, be enough to equip all Zone 1 facilities with HVAC/HEPA systems and provide funding over two years to support programs similar to the Chicago Mobile C.A.R.E. program and The Children's Clinic. Although it is not known which projects will ultimately be proposed and selected, the examples above show that this level of funding would provide the means to reduce cumulative air impacts for sensitive individuals downwind and in the area of the San Pedro Bay ports through both direct exposure reduction projects and preventative health programs in the near term (when emissions in the area are expected to be the greatest).

Summary: As described above, $10 million of funding for the Grant Programs ($5 million for Schools Program and $5 million for the Healthcare Program) would support projects and programs that would reduce cumulative air, noise and air-related health impacts for a substantial number of people in the areas most directly affected by goods-movement-related sources in the port area in the near term. These cumulative exposure mitigation projects and health-related prevention programs can be expeditiously implemented once the proposed Project receives final approval and any appeals have been exhausted.

To put the proposed Project grant funding in perspective, a *pro rata* estimate of 2007-2025 control costs for the whole Middle Harbor area (as part of the 2007 Air Quality Management Plan or AQMP) would be $190 million to $240 million (converted to 2008 dollars) in source reduction measures. Control costs to implement the 2007 AQMP (AQMP control measures, by industry group, are presented in Table 3-11 of the 2007 AQMP Socioeconomic Report (SER) (SCAQMD 2007b). Control costs attributed to the Middle Harbor area are estimated using the SCAQMD's estimated annual control costs for water transportation ($99 million) and, for a more conservative estimate, an additional 50 percent of both the rail and truck transportation (total costs of $30 million each). These costs are over the years 2007 to 2025 (19 years). These overall costs were then apportioned to the Middle Harbor area using emission estimates from the Middle Harbor Redevelopment Project EIS/EIR compared to overall 2007 POLB (POLB 2009b) and POLA (POLA 2009b) emissions.

The $10 million of grant funding from this Middle Harbor Project represents an additional four to five percent of those total estimated control costs to alleviate cumulative impacts in the near term before the full benefit of the AQMP source reduction measures is obtained. This would also be in addition to the costs associated with the implementation of the extensive mitigation measures included in the proposed Project that would reduce Project impacts below the existing CEQA Baseline. Unlike longer-term source control regulations and requirements that may not produce emission reductions for a number of years, these grant funded measures can be implemented quickly to mitigate cumulative air, health and noise impacts in the communities most affected by local port and non-port sources.

These cumulative mitigation measures will help to alleviate cumulative impacts for key sensitive populations in areas of maximal exposure in the near term. The Port contributions are intended to partially offset the incremental effects of the Middle Harbor Project that contribute to cumulative effects. The Port nonetheless concludes that these cumulative impacts remain significant and unavoidable.

The following mitigation measure is proposed to further reduce the effects of this impact on the community:

AQ-29: Cumulative Air Quality Impact Reduction Program. To help reduce cumulative air quality impacts of the Middle Harbor Redevelopment Project, the Port will require the Project to provide funding in support of the Schools and Related Sites Guidelines for the Port of Long Beach Grant Programs and Healthcare and Seniors Facility Program Guidelines for the Port of Long Beach Grant Programs in the amount of $5 million each. The distribution of these funds to potential applicants and projects will be determined through a public evaluation process and by approval of the Board of Harbor Commissioners.

The timing of the payments pursuant to **Mitigation Measures AQ-29** shall be made by the later of the following two dates: (1) the date that the Port issues a Notice to Proceed or otherwise authorizes the commencement of construction on the Phase 1 Construction Contract; or (2) the date that the Middle Harbor Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication.

AQMP Implementation

Operation of the Project would produce emissions of nonattainment pollutants primarily from diesel-powered sources **(Impact AQ-7)**. The 2007 AQMP proposes emission reduction measures that are designed to bring the SCAB into attainment of the national and state ambient air quality standards. The attainment strategies in this plan include mobile source control measures and clean fuel programs that are enforced at the federal and state level on engine manufacturers and petroleum refiners and retailers. The Project would automatically comply with these control measures that are independent of proposed operations. The SCAQMD adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. The Project would comply with these regulatory requirements which are designed to implement the AQMP.

The POLB provides SCAG with Port-wide cargo forecasts that are used to simulate growth scenarios in the AQMP, and the attainment demonstrations in the AQMP include emissions estimated for future growth at the Port (SCAG 2009). Since the 2007 AQMP assumes growth associated with the Project, it would not exceed the future growth projections in the 2007 AQMP and it would not conflict with nor obstruct implementation of the SIP. Moreover, because one objective of the AQMP is to improve the flow of goods at the Ports, the Project and the associated control measures work in concert to implement the 2007

AQMP. As a result, construction and operation of the unmitigated Project would result in less than cumulatively considerable contributions to the objective to implement the applicable AQMP under CEQA or NEPA.

Greenhouse Gases (Impact AQ-8)

Scientific evidence indicates a correlation between increasing global temperatures/climate change over the past century and human induced levels of GHG. These and other environmental changes have potentially negative environmental, economic, and social consequences around the globe. Based on this information, past, current, and future global emissions of GHG are, therefore, cumulatively significant.

Climate change, as it relates to man-made GHG emissions, is by nature a global impact. Thus, the issue of global climate change is a cumulative impact and an appreciable impact on global climate change would occur when GHG emissions from a project combine with GHG emissions from other man-made activities on a global scale.

GHG emissions from construction and operation of the mitigated Project would increase during each Project year relative to the NEPA and CEQA Baselines **(Impact AQ-8)**. Any concurrent emissions-generating activity that occurs worldwide would add additional air emission burdens to the GHG emission levels associated with the Project. It is unclear whether GHG emissions from the Project would make a significant contribution to the impact of global climate change when considered with GHG emissions generated by all natural and human activities. The Project GHG significance criterion states that any increase in GHG emissions above the CEQA Baseline is significant. Therefore, emissions of GHG from construction and operation of the mitigated Project would produce cumulatively considerable and unavoidable contributions to global climate change under CEQA.

As stated in Section 3.2.1.3, the Port is developing a Climate Change/Greenhouse Gas (CC/GHG) Strategic Plan (CC/GHG Plan), whose goal is to reduce the cumulative impact of GHG emissions from Ports operations. One element of the CC/GHG Plan is the Greenhouse Gas Emission Reduction Program Guidelines (GHG Guidelines). These Guidelines describe a procedure that the Port will use to select GHG emission reduction programs that meet the CC/GHG Plan reduction goals. Since the Project would produce significant levels of GHG emissions, the GHG Guidelines are included as the following mitigation measure to further reduce Project GHG emissions:

AQ-28: Greenhouse Gas Emission Reduction Program (GHG Program). To partially address the cumulative GHG impacts of the Middle Harbor Project, the Port will require this Project to provide funding for the GHG Program in the amount of $5 million. This money will be used to pay for measures pursuant to the GHG Emission Reduction Program Guidelines, include, but are not limited to, generation of green power from renewable energy sources, ship electrification, goods movement efficiency measures, cool roofs to reduce building cooling loads and the urban heat island effect, building upgrades for operational efficiency, tree planting for biological sequestration of CO_2, energy-saving lighting, and purchase of renewable energy certificates (RECs). However, after mitigation, these impacts would remain significant.

The timing of the payments pursuant to **Mitigation Measures AQ-28** shall be made by the later of the following two dates: (1) the date that the Port issues a Notice to Proceed or otherwise authorizes the commencement of construction on the Phase 1 Construction Contract; or (2) the date that the Middle Harbor Final EIR is conclusively determined to be valid, either by operation of Public Resources Code Section 21167.2 or by final judgment or final adjudication.

Because no NEPA impact significance threshold has been established for Project GHG emissions, no determination of significance has been made for this impact under NEPA.

3.2.4 Mitigation Monitoring Program

Implementation of **Mitigation Measures AQ-1** through AQ-29 would be required to reduce impacts on air quality, health risks, and climate change. All control measures and mitigation measures that were assumed in the analysis to reduce emissions will be a mandatory component of the facility lease. Final EIS/EIR Section 3.2.2.2 Table 3.2-11 includes clarifications of the emission control measures/regulations that apply to each unmitigated/mitigated Project scenario.

The proposed Project mitigation measures and associated monitoring requirements are summarized in Table 3.2-59. The Project Mitigation, Monitoring, and Reporting Program (MMRP) will require an annual report within the first year of Project approval and then annually thereafter, that documents compliance with implementing the mitigation measures approved in this Final EIS/EIR and adopted in the Project terminal lease agreement.

Table 3.2-1. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a,c]	----National Standards [b]----	
			Primary [c,d]	Secondary [c,e]
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	---	Same as primary
	8-hour	0.07 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Carbon monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	---
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 µ mg/m^3)	---
Nitrogen dioxide (NO_2)	Annual	0.03 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour	0.18 ppm (338 µg/m^3)	---	---
Sulfur dioxide (SO_2)	Annual	---	0.03 ppm (80 µg/m^3)	---
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	---
	3-hour	---	---	0.5 ppm (1,300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	---	---
Respirable Particulate Matter (PM_{10})	Annual	20 µg/m^3 [f]	---	---
	24-hour	50 µg/m^3	150 µg/m^3	Same as primary
Fine Particulate Matter ($PM_{2.5}$)	Annual	12 µg/m^3 [h]	15 µg/m^3 [i]	Same as primary
	24-hour	---	35 µg/m^3 [j]	Same as primary
Lead	30-day	1.5 µg/m^3	---	---
	Quarterly	---	1.5 µg/m^3	Same as primary
Hydrogen sulfide	1-hour	0.03 ppm (42 µg/m^3)	---	---
Sulfates	24-hour	25 µg/m^3	---	---
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	---	---
Visibility reducing particles [k]	8-hour (10 AM to 6 PM PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.	---	---

Notes:

a. California standards for O_3, CO, SO_2 (one hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. The standards for SO_2 (24-hour), sulfates, lead, hydrogen sulfide, and vinyl chloride standards are not to be equaled or exceeded.

b. National standards, other than O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

c. Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are based on a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibars). All measurements of air quality are to be corrected to these reference values; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. New standard of 0.075 ppm was adopted on March 12, 2008 and becomes in effect 60 days later.

e. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f. Measured as an arithmetic mean. New standard promulgated by ARB on June 20, 2002.

g. Measured as an arithmetic mean.

h. New standard promulgated by ARB on June 20, 2002.

i. Three-year average.

j. Three-year average of 95th percentile measurements.

k. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range when relative humidity is less than 70 percent.

Table 3.2-2. Maximum Pollutant Concentrations Measured at the North Long Beach Monitoring Station

Pollutant	Averaging Period	National Standard	State Standard	Highest Monitored Concentration				
				2004	2005	2006	2007	2008
Ozone (ppm)	1-hour	n/a	0.09	0.090	0.091	0.081	**0.099**	**0.089**
	8-hour	**0.075**	**0.07**	**0.074**	**0.068**	**0.058**	**0.073**	**0.074**
CO (ppm)	**1-hour**	**35**	**20**	**4.2**	**5.0**	**4.2**	**3.3**	**3.3**
	8-hour	**9**	**9**	**3.4**	**3.7**	**3.4**	**2.6**	**2.5**
NO_2 (ppm)	**1-hour**	**n/a**	**0.18**	**0.12**	**0.12**	0.10	0.11	0.08
	Annual	0.053	0.03	0.028	0.024	0.022	0.021	0.019
SO_2 (ppm)	1-hour	n/a	0.25	not avail.	0.04	0.027	0.037	0.087
	24-hour	0.14	0.04	0.013	0.010	0.010	0.009	0.010
	Annual	0.03	n/a	0.005	0.002	0.002	0.003	0.003
PM_{10} ($\mu g/m^3$)	24-hour	150	50	**72** [b]	**66** [b]	**117**	**232** [b]	44
	Annual	n/a	20	33	30	45	34	29
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	n/a	**67** [c]	**54** [c]	**59**	**83** [c]	**39** [c]
	Annual	15	12	**17.8**	**16.0**	**14.4**	14.6	13.3
Lead ($\mu g/m^3$)	30-day	n/a	1.5	NA	NA	0.03	NA	NA
	Calendar quarter	1.5	n/a	NA	NA	0.01	0.02	0.01
Sulfates ($\mu g/m^3$)	24-hour	n/a	25	NA	NA	NA	NA	NA

Notes:

Exceedances of the standards are bolded.

a. The state one-hour ozone standard was exceeded on zero days in 2004, one day in 2005, zero days in 2006, one day in 2007, and zero days in 2008 (through 9/30/2008). The national one-hour ozone standard was not exceeded.

b. The state 24-hour PM10 standard was exceeded on two of 57 (four percent) sampled days in 2004, . four of 61 (6 percent) sampled days in 2005, five of 61 (8 percent) sampled days in 2006, and 6 of 60 (10 percent) sampled days in 2007 . The number of 24-hour PM10 exceedances in 2008 is not available. The state annual PM10 standard was exceeded in 2004, 2005, 2006, and was inconclusive in 2007-2008 period. The national 24-hour PM10 standard was exceeded during the October 2007 fires (10/21/2007) The national 24-hour PM10 standard was not exceeded for the remainder of the monitoring period.

c. The federal 24-hour $PM_{2.5}$ standard was exceeded 24 times in 2004, 12 times in 2005, five times in 2006, 12 times in 2007, and two times in 2008. The state annual $PM_{2.5}$ standards was exceeded each year. The national annual $PM_{2.5}$ standard was exceeded in 2004 and 2005.

d. Pollutant data for calendar year 2008 inclusive to 9/30/2008.

Sources: SCAQMD 2006a; ARB 2006; EPA 2007b, and EPA 2009.

Table 3.2-3. Maximum Pollutant Concentrations Measured within the POLB Air Monitoring Network

Pollutant	Averaging Period	National Standard	State Standard	Monitoring Station [c]	
				Inner Harbor	Outer Harbor
Ozone (ppm)	1-hour	n/a	0.09	**0.093**	**0.10**
	8-hour	0.075	0.07	0.067	0.064
CO (ppm)	1-hour	35	20	6.09	4.92
	8-hour	9	9	5.00	4.23
NO_2 (ppm)	1-hour	n/a	0.18	0.15	0.14
	Annual	0.053	0.03	0.039	0.03
SO_2 (ppm)	1-hour	n/a	0.25	0.058	0.054
	24-hour	0.14	0.04	0.021	0.022
	Annual	0.03	n/a	0.007	0.007
PM_{10} ($\mu g/m^3$)	24-hour	150	50	**192** [d]	**211** [d]
	Annual	n/a	20	**57.3** [d]	**46.2** [d]
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	n/a	**74** [d]	**71** [d]
	Annual	15	12	**24.4** [d]	**22.3** [d]

Notes:

Exceedances of the standards are bolded.

a Data were collected from October 2006 through January 2008.

b Annual data are under review, but in general they are quite similar to the data collected at the North Long Beach Monitoring Station.

c. The Port's monitoring stations are not part of SCAQMD's regional air quality monitoring stations, but rather reflect "localized" concentration measurements in the Port region.

d. Excludes elevated values that were recorded during fires that occurred during that period.

Source: POLB 2008.

Table 3.2-4. Annual Conformity-Related Emissions Associated with Project Alternatives 1 and 2

Year	Emissions (Tons per Year)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Federal Action Construction Emissions – Alternative 1						
2009	0.26	1.54	4.57	0.05	0.40	0.23
2010	4.47	29.29	**87.36**	1.29	5.95	3.90
2011	1.58	8.25	**25.76**	0.73	2.29	1.36
2012	1.41	4.61	**12.89**	1.65	5.40	2.11
2013	1.68	7.91	**22.14**	1.46	5.29	2.20
2014	1.79	11.52	**34.30**	0.89	4.71	2.06
2015	1.48	6.71	**20.45**	0.84	4.49	1.80
2016	0.28	1.86	5.85	0.12	0.33	0.24
2017	1.79	7.64	**21.22**	0.90	2.12	1.55
2018	3.31	17.79	**54.19**	2.46	13.02	4.47
2019	0.61	2.55	8.52	1.61	8.16	2.04
Federal Action Construction Emissions – Alternative 2						
2009	0.26	1.54	4.57	0.05	0.40	0.23
2010	4.57	29.71	88.76	1.29	6.03	3.97
2011	1.59	8.30	25.93	0.73	2.31	1.37
2012	2.15	7.92	23.58	2.31	5.98	2.76
2013	2.77	14.23	40.81	3.10	5.77	3.24
2014	2.07	14.20	41.34	0.78	1.67	1.66
2015	0.66	2.89	8.46	0.37	1.68	0.75
Annual *De Minimis* Conformity Thresholds	**10**	**100**	**10**	**100**	**70**	**100**

Notes:

Items in Bold indicate an exceedance of the Annual De Minimis Conformity threshold.

There are no federal action construction emissions for Project Alternative 2 after 2015.

Table 3.2-5. Average Daily Emissions Associated with Existing Operations at the Middle Harbor Terminals – Year 2005

Activity	Emissions (Pounds per day)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Ships – Fairway Transit	53	120	1,394	799	120	112
Ships – Precautionary Area Transit	12	25	216	120	20	19
Ships – Harbor Transit	15	23	180	76	19	17
Ships – Docking	5	8	60	25	6	6
Ships – Hoteling Aux. Sources	53	190	1,910	1,756	98	92
Tugs – Cargo Vessel Assist	2	12	66	0	2	2
Terminal Equipment	68	207	1,380	27	33	30
On-Road Trucks	488	2,274	7,318	41	368	338
Trains	17	37	260	20	9	9
Railyard Equipment	5	12	101	1	2	2
Worker Commuter Vehicles	4	119	10	0	0	0
Total Daily Emissions	**721**	**3,028**	**12,894**	**2,865**	**676**	**627**

Table 3.2-6. Peak Daily Emissions Associated with Existing Operations at the Middle Harbor Terminals – Year 2005

Activity	Emissions (Pounds per day)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Ships – Fairway Transit	--	--	--	--	--	--
Ships – Precautionary Area Transit	--	--	--	--	--	--
Ships – Harbor Transit	--	--	--	--	--	--
Ships – Docking	--	--	--	--	--	--
Ships – Hoteling Aux. Sources	105	311	3,346	2,900	337	328
Tugs – Cargo Vessel Assist	3	22	119	1	4	4
Terminal Equipment	317	954	6,494	69	152	140
On-Road Trucks	739	3,410	10,948	62	552	508
Trains	46	99	687	52	25	25
Railyard Equipment	12	31	268	3	5	5
Worker Commuter Vehicles	4	119	10	0	0	0
Total Daily Emissions	**1,226**	**4,946**	**21,872**	**3,086**	**1,075**	**1,008**

Table 3.2-7. Annual GHG Emissions due to Operations Within California - Middle Harbor Project CEQA Baseline (Year 2005)

Project Scenario/Source Type	Emissions (Metric Tons Per Year)						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Ships	28,397	1.83	0.08	--	--	--	28,458
Tugboats	478	0.07	0.00	--	--	--	481
Terminal & Railyard Equipment	10,458	1.51	0.11	--	--	--	10,550
Trucks	123,451	31.93	15.97	--	--	--	129,071
Trains	6,213	0.87	0.06	--	--	--	6,250
Reefer Refrigerant Losses	--	--	--	0.06	0.15	0.06	620
On-Terminal Electricity Usage	13,131	0.11	0.06	--	--	--	13,152
Worker Vehicles	1,690	0.31	0.30	--	--	--	1,789
Year 2005 Total	**183,844**	**37**	**17**	**0.06**	**0.15**	**0.06**	**190,371**

Notes:

One metric ton equals 1000 kilograms, 2205 lbs, or 1.1 U.S. (short) tons.

CO_2e = The carbon dioxide equivalent emissions of all GHG combined. The carbon dioxide equivalent emission rate for each GHG represents the emission rate multiplied by its GWP. The GWPs are 1 for CO_2; 21 for CH_4; 310 for N_2O.

Table 3.2-8. SCAQMD and State Significance Thresholds for Ambient Pollutant Concentrations Associated with Proposed Construction

Air Pollutant	Ambient Concentration Threshold
Nitrogen Dioxide (NO_2) 1-hour average	0.18 ppm (338 μg/m^3)* [State]
Particulates (PM_{10} or $PM_{2.5}$) 24-hour average	10.4 μg/m^3
Carbon Monoxide (CO) 1-hour average 8-hour average	20 ppm (23,000 μg/m^3) [State] 9.0 ppm (10,000 μg/m^3) [State/Federal]

Notes:

The NO_2 and CO thresholds are absolute thresholds; the maximum predicted impact from construction activities is added to the background concentration for the Project vicinity and compared to the threshold.

The PM_{10} and $PM_{2.5}$ thresholds are an incremental threshold, meaning that the maximum predicted impacts from construction activities (without adding background concentrations) are compared to these thresholds.

The SCAQMD does not require an analysis of ambient annual pollutant concentrations from construction activities (POLA 2006c).

* To evaluate Project impacts to ambient NO_2 levels, the analysis replaced the use of the current SCAQMD NO_2 thresholds with the revised one-hour California ambient air quality standard of 338 μg/m^3 as the state standard constitutes the most stringent applicable requirement.

Source: SCAQMD 2006c.

Table 3.2-9. SCAQMD and State Significance Thresholds for Ambient Pollutant Concentrations Associated with Proposed Project Operations

Air Pollutant	Ambient Concentration Threshold
Nitrogen Dioxide (NO_2) 1-hour average annual average	0.18 ppm (338 μg/m^3)* 0.030 ppm (56 μg/m^3)*
Particulates (PM_{10} or $PM_{2.5}$) 24-hour average	2.5 μg/m^3
Carbon Monoxide (CO) 1-hour average 8-hour average	20 ppm (23,000 μg/m^3) 9.0 ppm (10,000 μg/m^3)

Notes:

The NO_2 and CO thresholds are absolute thresholds; the maximum predicted impact from proposed Project operations is added to the background concentration for the Project vicinity and compared to the threshold.

The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds. For CEQA significance, the maximum increase in concentration relative to the 2005 baseline (i.e., Project impact minus baseline impact) is compared to each threshold. For NEPA significance, the maximum increase in concentration relative to NEPA (i.e., Project impact minus NEPA Baseline impact) is compared to the threshold.

* To evaluate Project impacts to ambient NO_2 levels, the analysis replaced the use of the current SCAQMD NO_2 thresholds with the revised one-hour and annual California ambient air quality standards of 338 and 56 μg/m^3, respectively, as the state standard constitutes the most stringent applicable requirement.

Source: SCAQMD 2006c.

Table 3.2-10. Middle Harbor Project Air Quality Assumptions for Proposed Construction Scenarios

Source/Assumption	Unmitigated and Mitigated Project Scenarios		
	Alt 1	Alt 2	Alt 3
Tugboats			
Main and Aux. Engines – ARB Harbor Craft Regulation	X	X	X
Main and Aux. Engines – ULSD	X	X	X
Trucks			
ARB Port Truck Regulation Fleet	X	X	X
Engines – ULSD	X	X	X
Construction Equipment			
Engines – EPA Nonroad Tier 3 Equivalent Standards	X	X	X
Engines – ULSD	X	X	X
Fugitive Dust			
Reduced 75% from Uncontrolled Levels	X[1]	X[1]	X[1]

Notes:
1. Mitigated scenarios would reduce fugitive dust by 90% from uncontrolled levels.

Abbreviations: ULSD - ultra low sulfur diesel.

Table 3.2-11. Middle Harbor Project Air Quality Assumptions for Proposed Operational Scenarios

Source/Assumption	CAAP Measure	Project Scenario[1]							
		Baselines		Unmitigated			Mitigated		
		CEQA	NEPA	Alt 1	Alt 2	Alt 4	Alt 1	Alt 2	Alt 3
OGV									
Vessel Speed Reduction Program	OGV1		X	X	X	X	X	X	X
Main Engines - 2.7% S RFO		X							
Main Engines - 0.2% S RFO	OGV4		X				X	X	X
Aux. Engines - 71/29% RFO/MGO @ 2.7/0.5% S		X							
Aux. Engines - 0.2% S MGO	OGV3		X				X	X	X
Aux. Engines - Cold-ironed - 90% Control	OGV2		X				X	X	X
Aux. Engines - ARB Berthing Regulation			X	X	X	X	X	X	X
All Sources – 1.5/0.1% S Diesel pre-2012/2012[2]				X	X	X			
All Sources – 0.1% S Diesel in 2012[2]			X				X	X	X
Tugboats									
Year 2005 = Baseline Fleet		X							
ARB Harbor Craft Regulation	HC1		X	X	X	X	X	X	X
Main/Aux. Engines - 0.19% S Diesel		X							
Main/Aux. Engines – ULSD			X	X	X	X	X	X	X
Locomotives									
Switch Locomotives = 2005 Baseline Fleet		X							
Switch Locomotives = Tier 2 + DOCs	RL1		X	X	X	X	X	X	X
Switch Locomotives = 0.035% S Diesel		X							
Switch Locomotives = ULSD			X	X	X	X	X	X	X
Line Haul Locomotives = National Fleet		X	X	X	X	X	X	X	X
Line Haul/Switch Locomotives = Tier 3 in 2025			X	X	X	X	X	X	X
Line Haul Locomotives = 0.22% S Diesel		X							
Line Haul Locomotives = ULSD Year 2012			X	X	X	X	X	X	X
Trucks									
Port 2005 Baseline Fleet		X							
ARB Port Truck Regulation Fleet			X	X	X	X	X	X	X
Clean Truck Program Fleet	HDV1		X				X	X	X
0.035% S Diesel		X							
ULSD			X	X	X	X	X	X	X
Terminal/Rail yard Equipment									
Year 2005 = Baseline Fleet		X							
ARB CHE Regulation Only Fleet				X	X	X			
ARB CHE Regulation + CAAP CHE1 Fleet	CHE1		X				X	X	X
0.035% S Diesel		X							
ULSD			X	X	X	X	X	X	X

Notes: 1. All project scenarios begin in 2010, except the CEQA Baseline is fixed at year 2005 emission levels.
2. In compliance with the ARB Fuel Sulfur Regulation for OGVs.

Abbreviations: S – sulfur; RFO - residual fuel oil, MGO - marine gas oil; ULSD - ultra low sulfur diesel; DOCs - diesel oxidation catalysts; CHE - cargo handling equipment.

Table 3.2-12. Daily Emissions Associated with Construction for the NEPA Baseline

Construction Phase/Stage	Emissions (pounds per day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Phase 1 / Stage 1	12	49	173	0	456	103
Phase 1 / Stage 2	5	46	47	0	303	68
Phase 1 / Stage 3	12	49	173	0	779	171
Phase 1 / Stage 4	13	55	174	0	1,249	269
Phase 1 / Stage 5	14	73	175	0	1,251	271
Phase 2 / Stage 1	12	49	173	0	545	117
Phase 2 / Stage 4	6	37	75	0	34	9
Peak Daily Emissions [1,2,3]	24	120	347	1	1,257	280
Mitigated Peak Daily Emissions [3]	24	120	347	1	515	132
SCAQMD Daily Significance Thresholds	75	550	100	150	150	55

Notes:

1. Peak daily construction emissions of all pollutants except PM_{10}/$PM_{2.5}$ would occur during Phase 1/Stage 3 through Phase 1/Stage 5 in association with (a) container yard development, (b) Seaside Railyard area redevelopment, and/or, (c) new container yard construction, and (d) commuting of workers.
2. Peak daily construction emissions of PM_{10}/$PM_{2.5}$ would mainly occur as fugitive dust during Phase 1/Stage 4, Phase 1/Stage 5, and Phase 2/Stage 2 in associated with (a) Seaside Railyard area redevelopment, (b) new container yard construction, (c) new terminal building construction, (d) construction wharf at Berth 23, and (e) commuting of workers.
3. Bolded data represents an exceedance of a SCAQMD emission threshold.

Table 3.2-13. Average Daily Emissions Associated with Operations for the NEPA Baseline

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	85	110	1,058	41	20	19
Ships - Precautionary Area Transit (1)	29	37	324	14	7	6
Ships - Harbor Transit (1)	33	32	284	11	6	6
Ships - Docking (1)	13	11	102	4	2	2
Ships - Hoteling Aux. Sources	38	114	1,033	89	21	20
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	21	103	600	1	12	11
On-road Trucks	380	1,638	5,658	8	43	40
Trains	13	33	180	4	5	5
Railyard Equipment	0	2	7	0	0	0
Commuting	2	78	6	0	0	0
Project Year 2010 Total	**616**	**2,171**	**9,317**	**172**	**120**	**112**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	46	25	24
Ships - Precautionary Area Transit (1)	36	46	406	13	8	7
Ships - Harbor Transit (1)	41	40	354	8	8	7
Ships - Docking (1)	16	14	128	3	3	3
Ships - Hoteling Aux. Sources	10	63	296	25	6	5
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	10	179	176	1	2	2
On-road Trucks	186	762	2,435	9	35	33
Trains	108	298	1,506	1	39	36
Railyard Equipment	2	29	27	0	0	0
Commuting	1	63	4	0	0	0
Project Year 2015 Total	**518**	**1,649**	**6,702**	**106**	**128**	**118**
Project Year 2020						
Ships - Fairway Transit (1)	127	165	1,591	54	30	28
Ships - Precautionary Area Transit (1)	42	55	483	15	10	9
Ships - Harbor Transit (1)	52	50	435	9	10	9
Ships - Docking (1)	20	17	153	3	3	3
Ships - Hoteling Aux. Sources	12	75	350	30	7	6
Tugboats - Cargo Vessel Assist (1)	2	19	34	0	1	1
Terminal Equipment	6	146	104	1	1	1
On-road Trucks	233	956	2,642	10	49	45
Trains	129	385	1,820	1	47	43
Railyard Equipment	0	17	2	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**625**	**1,930**	**7,616**	**124**	**158**	**147**
Project Year 2030						
Ships - Fairway Transit (1)	155	202	1,974	68	37	35
Ships - Precautionary Area Transit (1)	52	68	597	19	12	11
Ships - Harbor Transit (1)	62	60	523	12	11	11
Ships - Docking (1)	24	21	186	4	4	4
Ships - Hoteling Aux. Sources	15	97	438	38	8	8
Tugboats - Cargo Vessel Assist (1)	3	25	45	0	1	1
Terminal Equipment	8	173	135	1	2	2
On-road Trucks	201	825	2,110	12	58	53
Trains	111	376	1,584	1	29	27
Railyard Equipment	0	16	2	0	0	0
Commuting	1	35	2	0	1	1
Project Year 2030 Total	**633**	**1,898**	**7,595**	**156**	**163**	**151**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.
(1) Includes auxiliary generator emissions.

Table 3.2-14. Annual GHG Emissions due to Operations Within California - Middle Harbor Container Terminal NEPA Baseline

Project Scenario/Source Type	Emissions (Metric Tons Per Year)						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Year 2010							
Ships	37,817	5.16	0.33	-	-	-	38,027
Tugboats	541	0.07	0.01	-	-	-	544
Terminal & Railyard Equipment	14,495	2.09	0.15	-	-	-	14,364
Trucks	141,430	26.35	13.17	-	-	-	146,067
Trains	4,857	0.68	0.05	-	-	-	4,886
Reefer Refrigerant Losses	-	-	-	0.07	0.17	0.08	790
AMP Usage	1,715	0.014	0.008	-	-	-	1,717
On-Terminal Electricity Usage	15,733	0.13	0.07	-	-	-	15,758
Worker Vehicles	2,035	0.37	0.36	-	-	-	2,155
Year 2010 Total	**218,623**	**35**	**14**	**0.07**	**0.17**	**0.08**	**224,529**
Year 2015							
Ships	39,537	5.38	0.33	-	-	-	39,753
Tugboats	677	0.09	0.01	-	-	-	681
Terminal & Railyard Equipment	18,249	2.24	0.16	-	-	-	18,407
Trucks	149,498	27.81	13.91	-	-	-	154,393
Trains	43,473	6.09	0.43	-	-	-	43,734
Reefer Refrigerant Losses	-	-	-	0.10	0.23	0.10	1,061
AMP Usage	3,669	0.031	0.017	-	-	-	3,675
On-Terminal Electricity Usage	23,582	0.20	0.11	-	-	-	23,620
Worker Vehicles	2,353	0.43	0.42	-	-	-	2,491
Year 2015 Total	**281,083**	**43**	**15**	**0.10**	**0.23**	**0.10**	**287,815**
Year 2020							
Ships	46,938	6.39	0.39	-	-	-	47,194
Tugboats	812	0.11	0.01	-	-	-	817
Terminal & Railyard Equipment	12,360	1.78	0.13	-	-	-	12,436
Trucks	168,108	30.87	15.44	-	-	-	173,542
Trains	56,212	7.87	0.55	-	-	-	56,549
Worker Vehicles	2,710	0.50	0.48	-	-	-	2,869
Cold-Ironing + RMG Electrification	13,547	0.11	0.06	-	-	-	13,569
Reefer Refrigerant Losses	-	-	-	0.11	0.27	0.12	1,234
On-Terminal Electricity Usage	28,977	0.24	0.13	-	-	-	29,023
Year 2020 Total	**329,664**	**48**	**17**	**0.11**	**0.27**	**0.12**	**337,234**
Year 2030							
Ships	58,773	7.99	0.49	-	-	-	59,093
Tugboats	1,082	0.15	0.01	-	-	-	1,089
Terminal & Railyard Equipment	14,707	2.12	0.15	-	-	-	14,798
Trucks	209,056	38.03	19.01	-	-	-	215,748
Trains	54,938	7.69	0.54	-	-	-	55,268
Worker Vehicles	3,595	0.66	0.64	-	-	-	3,806
Cold-Ironing + RMG Electrification	16,986	0.141	0.078	-	-	-	17,013
Reefer Refrigerant Losses	-	-	-	0.13	0.31	0.14	1,426
On-Terminal Electricity Usage	31,467	0.26	0.14	-	-	-	31,517
Year 2030 Total	**390,604**	**57**	**21**	**0.13**	**0.31**	**0.14**	**399,758**

Notes:

One metric ton equals 1000 kilograms, 2205 lbs, or 1.1 U.S. (short) tons.

CO_2e = the carbon dioxide equivalent emissions of all GHG combined. The carbon dioxide equivalent emission rate for each GHG represents the emission rate multiplied by its GWP. The GWPs are 1 for CO2; 21 for CH4; 310 for N2O; 2800 for HFC-125; 1300 for HFC-134a; and 3800 for HFC-143a.

Table 3.2-15. Daily Emissions for Construction Activities Associated with the 345-Acre Alternative

Construction Phase/Stage	Emissions (pounds per day)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Phase 1 / Stage 1	169	1,109	5,179	15	524	213
Phase 1 / Stage 2	48	362	1,287	5	344	106
Phase 1 / Stage 3	52	340	934	4	801	192
Phase 1 / Stage 4	13	55	174	0	1,247	267
Phase 1 / Stage 5	14	73	175	0	1,247	267
Phase 2 / Stage 1	69	372	939	7	814	203
Phase 2 / Stage 2	90	526	1,335	9	1,268	286
Phase 2 / Stage 3	31	129	425	1	643	151
Phase 2/Stage 4	6	37	75	0	34	9
Peak Daily Emissions – CEQA Impact[1,2,5]	**169**	**1,109**	**5,179**	15	**1,288**	**304**
Mitigated Peak Daily Emissions – CEQA Impact [5]	**169**	**1,109**	**5,179**	15	**499**	**107**
Peak Daily Emissions – NEPA Impact [3,5]	**157**	**1,060**	**5,005**	14	**341**	**103**
Mitigated Peak Daily Emissions – NEPA Impact [4,5]	**157**	**1,060**	**5,005**	14	135	41
SCAQMD Daily Significance Thresholds	75	550	100	150	150	55

Notes:

1. Peak daily construction emissions of all pollutants except PM10/PM2.5 would occur during Phase 1/Stage 1 and due to (a) excavation fronting E24, (b) construct new armor slope, (c) E 24 wharf construction, (d) fill within dike, (e) excavate & truck material in cell bulkhead and fronting Pier D, (f) demo - E12-13 wharf, (g) lift #1 (~ -30), and (h) commuting of workers.
2. Peak daily construction emissions of PM_{10}/$PM_{2.5}$ would mainly occur as fugitive dust during Phase 1/Stage 4, Phase 1/Stage 5, and Phase 2/Stage 2 and due to (a) Seaside Railyard area redevelopment, (b) new container yard construction, (c) new terminal building construction, (d) dredging and excavation at quay all, (e) construct wharf, armor, fill, and (f) commuting of workers.
3. Equal to Project construction emissions in this table minus NEPA Baseline construction emissions presented in Table 3.2-10.
4. Equal to Project mitigated construction emissions minus NEPA Baseline mitigated construction emissions.
5. Bolded data represents an exceedance of a SCAQMD emission threshold.

Table 3.2-16. Maximum Ambient Pollutant Impacts – Unmitigated Proposed Project Construction Activities for the 345-Acre Alternative

Pollutant	Averaging Time	Maximum Project Impact (µg/m³) [a]	Background Pollutant Concentration (µg/m³)	Maximum Project Impact + Background (µg/m³) [a]	SCAQMD Threshold (µg/m³)
NO_2 [d]	1-hour	84	226	310	338
CO	1-hour	687	4,667	5,354	23,000
	8-hour	119	3,778	3,897	10,000
PM_{10} [a]	24-hour	**40.4**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	9.6	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and, therefore, only impacts from Project emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Project emissions plus background pollutant concentrations are compared to the thresholds.
b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.
c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005b). Offsite emissions from tugboats/barges and trucks are addressed under **Impact AQ-1**.
d. NO_2 concentrations were calculated assuming a 46.7 percent conversion rate from NO_x to NO_2 (SCAQMD, 2003c). This conversion rate assumes the maximum impact locations occur within 1000 meters of emission sources that contribute to this impact.

Table 3.2-17. Maximum Ambient Pollutant Impacts – Mitigated Proposed Project Construction Activities for the 345-Acre Alternative

Pollutant	Averaging Time	Maximum Project Impact (μg/m³) [a]	Background Pollutant Concentration (μg/m³)	Maximum Project Impact + Background (μg/m³) [a]	SCAQMD Threshold (μg/m³)
NO_2 [d]	1-hour	84	226	310	338
CO	1-hour	687	4,667	5,354	23,000
	8-hour	119	3,778	3,897	10,000
PM_{10} [a]	24-hour	**17.1**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	4.7	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and, therefore, only impacts from Project emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Project emissions plus background pollutant concentrations are compared to the thresholds.

b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.

c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005c). Offsite emissions from tugboats/barges and trucks are addressed under **Impact AQ-1**.

d. NO_2 concentrations were calculated assuming a 46.7 percent conversion rate from NO_x to NO_2 (SCAQMD 2003c). This conversion rate assumes the maximum impact locations occur within 1,000 meters of emission sources that contribute to this impact.

Table 3.2-18. Annual Average Daily Operational Emissions Associated with the Unmitigated 345-Acre Project Alternative

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	80	122	1,092	339	68	64
Ships - Precautionary Area Transit (1)	27	41	334	112	22	21
Ships - Harbor Transit (1)	31	35	293	89	22	20
Ships - Docking (1)	12	12	106	30	8	7
Ships - Hoteling Aux. Sources	47	136	1,379	851	92	86
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	36	225	978	1	30	27
On-road Trucks	430	1,672	8,348	8	65	59
Trains	13	34	186	4	5	5
Railyard Equipment	0	3	11	0	0	0
Commuting	2	86	6	0	0	0
Project Year 2010 Total	**681**	**2,380**	**12,796**	**1,435**	**314**	**292**
Net Change from 2005 CEQA Baseline	**(40)**	**(648)**	**(98)**	**(1,430)**	**(362)**	**(334)**
Net Change from NEPA Baseline Year 2010	**65**	**209**	**3,479**	**1,263**	**193**	**181**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	25	23	21
Ships - Precautionary Area Transit (1)	36	46	406	8	7	7
Ships - Harbor Transit (1)	41	40	354	7	7	7
Ships - Docking (1)	16	14	128	2	3	2
Ships - Hoteling Aux. Sources	32	103	859	39	16	15
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	12	210	220	1	2	2
On-road Trucks	146	669	2,029	7	33	31
Trains	163	449	2,272	2	60	55
Railyard Equipment	2	30	27	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**556**	**1,780**	**7,670**	**92**	**152**	**141**
Net Change from 2005 CEQA Baseline	**(165)**	**(1,248)**	**(5,224)**	**(2,773)**	**(524)**	**(486)**
Net Change from NEPA Baseline Year 2015	**38**	**131**	**968**	**(13)**	**25**	**23**
Project Year 2020						
Ships - Fairway Transit (1)	138	179	1,717	32	29	28
Ships - Precautionary Area Transit (1)	47	60	528	11	10	9
Ships - Harbor Transit (1)	51	52	460	9	9	9
Ships - Docking (1)	21	19	170	3	4	3
Ships - Hoteling Aux. Sources	19	82	519	32	10	9
Tugboats - Cargo Vessel Assist (1)	2	19	34	0	1	1
Terminal Equipment	16	266	265	1	1	1
On-road Trucks	210	970	2,517	9	54	49
Trains	191	572	2,704	2	70	64
Railyard Equipment	3	46	41	0	0	0
Commuting	1	51	3	0	1	0
Project Year 2020 Total	**699**	**2,317**	**8,959**	**100**	**188**	**174**
Net Change from 2005 CEQA Baseline	**(23)**	**(711)**	**(3,935)**	**(2,765)**	**(488)**	**(453)**
Net Change from NEPA Baseline Year 2020	**74**	**387**	**1,343**	**(24)**	**30**	**27**
Project Year 2030 Total						
Ships - Fairway Transit (1)	159	206	1,970	37	34	32
Ships - Precautionary Area Transit (1)	54	69	605	12	11	10
Ships - Harbor Transit (1)	62	61	542	10	11	10
Ships - Docking (1)	25	22	196	3	4	4
Ships - Hoteling Aux. Sources	22	95	596	37	11	10
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	22	345	364	2	4	4
On-road Trucks	206	848	2,169	12	59	55
Trains	169	572	2,409	2	44	40
Railyard Equipment	3	49	46	0	1	1
Commuting	1	41	2	0	1	1
Project Year 2030 Total	**725**	**2,330**	**8,937**	**117**	**180**	**167**
Net Change from 2005 CEQA Baseline	**4**	**(698)**	**(3,957)**	**(2,749)**	**(496)**	**(460)**
Net Change from NEPA Baseline Year 2030	**91**	**432**	**1,342**	**(40)**	**17**	**16**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.

(1) Includes auxiliary generator emissions.

Table 3.2-19. Peak Daily Operational Emissions Associated with the Unmitigated 345-Acre Project Alternative

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	105	162	1,496	468	92	86
Ships - Precautionary Area Transit (1)	39	58	459	155	30	28
Ships - Harbor Transit (1)	36	43	352	114	26	24
Ships - Docking (1)	17	17	137	38	10	10
Ships - Hoteling Aux. Sources	117	324	3,431	2,014	228	214
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	137	849	3,693	4	113	104
On-road Trucks	641	2,495	12,457	12	96	89
Trains	39	100	538	12	15	15
Railyard Equipment	1	9	31	0	1	1
Commuting	2	86	6	0	0	0
Project Year 2010 Total	**1,136**	**4,164**	**22,712**	**2,817**	**615**	**574**
Net Change from 2005 CEQA Baseline	**(90)**	**(781)**	**841**	**(269)**	**(459)**	**(435)**
Net Change from NEPA Baseline Year 2010	**162**	**649**	**6,926**	**2,524**	**396**	**369**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	81	46	43
Ships - Precautionary Area Transit (1)	65	84	737	23	15	14
Ships - Harbor Transit (1)	64	68	616	15	13	12
Ships - Docking (1)	30	26	237	5	5	5
Ships - Hoteling Aux. Sources	62	193	1,681	73	31	29
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	36	618	647	4	6	6
On-road Trucks	217	998	3,026	10	49	46
Trains	180	498	2,516	2	66	66
Railyard Equipment	2	33	30	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**859**	**2,860**	**11,960**	**213**	**233**	**222**
Net Change from 2005 CEQA Baseline	**(366)**	**(2,085)**	**(9,912)**	**(2,873)**	**(841)**	**(787)**
Net Change from NEPA Baseline Year 2015	**61**	**204**	**1,679**	**33**	**45**	**44**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	48	194	1,313	75	24	23
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	52	888	885	5	5	4
On-road Trucks	313	1,447	3,755	13	80	74
Trains	199	597	2,822	2	73	73
Railyard Equipment	3	48	43	0	0	0
Commuting	1	51	3	0	1	0
Project Year 2020 Total	**827**	**3,500**	**11,229**	**172**	**230**	**219**
Net Change from 2005 CEQA Baseline	**(399)**	**(1,446)**	**(10,643)**	**(2,914)**	**(845)**	**(790)**
Net Change from NEPA Baseline Year 2020	**98**	**806**	**2,183**	**38**	**46**	**45**
Project Year 2030						
Ships - Fairway Transit (1)	173	223	2,109	71	40	38
Ships - Precautionary Area Transit (1)	57	74	647	20	13	12
Ships - Harbor Transit (1)	93	79	695	13	16	15
Ships - Docking (1)	27	24	216	4	5	4
Ships - Hoteling Aux. Sources	48	194	1,313	75	24	23
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	81	1,282	1,355	7	15	13
On-road Trucks	308	1,264	3,235	17	88	81
Trains	177	597	2,514	2	46	46
Railyard Equipment	3	52	49	0	1	1
Commuting	1	41	2	0	1	1
Project Year 2030 Total	**970**	**3,852**	**12,175**	**211**	**249**	**235**
Net Change from 2005 CEQA Baseline	**(256)**	**(1,094)**	**(9,697)**	**(2,875)**	**(825)**	**(774)**
Net Change from NEPA Baseline Year 2030	**280**	**1,045**	**3,642**	**52**	**63**	**60**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-20. Annual Average Daily Operational Emissions Associated with the Mitigated 345-Acre Project Alternati

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	85	110	1,058	41	20	19
Ships - Precautionary Area Transit (1)	29	37	324	14	7	6
Ships - Harbor Transit (1)	33	32	284	11	6	6
Ships - Docking (1)	13	11	102	4	2	2
Ships - Hoteling Aux. Sources	36	107	971	83	20	19
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	24	114	683	1	14	13
On-road Trucks	396	1,709	5,906	9	45	42
Trains	13	34	186	4	5	5
Railyard Equipment	0	1	6	0	0	0
Commuting	2	86	6	0	0	0
Project Year 2010 Total	**634**	**2,256**	**9,591**	**167**	**123**	**114**
Net Change from 2005 CEQA Baseline	**(95)**	**(784)**	**(3,325)**	**(2,698)**	**(556)**	**(515)**
Net Change from NEPA Baseline Year 2010	**17**	**85**	**274**	**(5)**	**2**	**2**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	46	25	24
Ships - Precautionary Area Transit (1)	36	46	406	13	8	7
Ships - Harbor Transit (1)	41	40	354	8	8	7
Ships - Docking (1)	16	14	128	3	3	3
Ships - Hoteling Aux. Sources	9	56	262	22	5	5
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	12	210	220	1	2	2
On-road Trucks	142	653	1,950	7	33	30
Trains	163	449	2,272	2	60	55
Railyard Equipment	2	30	27	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**531**	**1,718**	**6,993**	**102**	**145**	**134**
Net Change from 2005 CEQA Baseline	**(198)**	**(1,323)**	**(5,923)**	**(2,763)**	**(534)**	**(495)**
Net Change from NEPA Baseline Year 2015	**12**	**68**	**292**	**(3)**	**18**	**16**
Project Year 2020						
Ships - Fairway Transit (1)	138	179	1,717	58	33	31
Ships - Precautionary Area Transit (1)	47	60	528	17	10	10
Ships - Harbor Transit (1)	51	52	460	11	10	9
Ships - Docking (1)	21	19	170	3	4	4
Ships - Hoteling Aux. Sources	12	67	326	27	6	6
Tugboats - Cargo Vessel Assist (1)	2	19	34	0	1	1
Terminal Equipment	7	160	111	1	2	1
On-road Trucks	230	945	2,609	10	49	45
Trains	191	572	2,704	2	70	64
Railyard Equipment	0	19	2	0	0	0
Commuting	1	51	3	0	1	0
Project Year 2020 Total	**700**	**2,144**	**8,664**	**128**	**184**	**171**
Net Change from 2005 CEQA Baseline	**(29)**	**(897)**	**(4,253)**	**(2,737)**	**(494)**	**(458)**
Net Change from NEPA Baseline Year 2020	**75**	**214**	**1,048**	**4**	**26**	**24**
Project Year 2030						
Ships - Fairway Transit (1)	159	206	1,970	67	38	35
Ships - Precautionary Area Transit (1)	54	69	605	19	12	11
Ships - Harbor Transit (1)	62	61	542	12	12	11
Ships - Docking (1)	25	22	196	4	4	4
Ships - Hoteling Aux. Sources	13	78	375	31	7	7
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	9	191	145	1	2	2
On-road Trucks	206	847	2,166	12	59	54
Trains	169	572	2,409	2	44	40
Railyard Equipment	0	18	2	0	0	0
Commuting	1	41	2	0	1	1
Project Year 2030 Total	**701**	**2,127**	**8,451**	**148**	**179**	**166**
Net Change from 2005 CEQA Baseline	**(28)**	**(913)**	**(4,465)**	**(2,717)**	**(499)**	**(463)**
Net Change from NEPA Baseline Year 2030	**68**	**229**	**856**	**(8)**	**16**	**15**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.

(1) Includes auxiliary generator emissions.

Table 3.2-21. Peak Daily Operational Emissions - Mitigated Alternative 1

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	111	146	1,450	57	28	26
Ships - Precautionary Area Transit (1)	41	53	445	19	9	9
Ships - Harbor Transit (1)	38	40	342	14	8	7
Ships - Docking (1)	18	15	133	5	3	3
Ships - Hoteling Aux. Sources	74	218	1,995	170	41	39
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	90	431	2,577	4	52	48
On-road Trucks	591	2,551	8,814	13	68	62
Trains	39	100	538	12	15	15
Railyard Equipment	1	4	19	0	0	0
Commuting	2	86	6	0	0	0
Project Year 2010 Total	**1,008**	**3,666**	**16,431**	**293**	**228**	**212**
Net Change from 2005 CEQA Baseline	**(218)**	**(1,280)**	**(5,441)**	**(2,793)**	**(847)**	**(796)**
Net Change from NEPA Baseline Year 2010	**34**	**151**	**645**	**1**	**8**	**7**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	81	46	43
Ships - Precautionary Area Transit (1)	65	84	737	23	15	14
Ships - Harbor Transit (1)	64	68	616	15	13	12
Ships - Docking (1)	30	26	237	5	5	5
Ships - Hoteling Aux. Sources	17	99	489	39	9	9
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	36	620	648	4	6	6
On-road Trucks	212	974	2,908	11	49	45
Trains	180	498	2,516	2	66	66
Railyard Equipment	2	33	30	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**810**	**2,744**	**10,651**	**179**	**212**	**202**
Net Change from 2005 CEQA Baseline	**(416)**	**(2,202)**	**(11,221)**	**(2,907)**	**(863)**	**(807)**
Net Change from NEPA Baseline Year 2015	**11**	**87**	**369**	**(1)**	**24**	**24**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	28	153	800	60	15	14
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	23	535	368	3	5	5
On-road Trucks	343	1,409	3,892	14	73	67
Trains	199	597	2,822	2	73	73
Railyard Equipment	0	20	3	0	0	0
Commuting	1	51	3	0	1	0
Project Year 2020 Total	**806**	**3,042**	**10,296**	**156**	**214**	**203**
Net Change from 2005 CEQA Baseline	**(420)**	**(1,904)**	**(11,576)**	**(2,930)**	**(861)**	**(805)**
Net Change from NEPA Baseline Year 2020	**77**	**348**	**1,250**	**22**	**30**	**30**
Project Year 2030						
Ships - Fairway Transit (1)	173	223	2,109	71	40	38
Ships - Precautionary Area Transit (1)	57	74	647	20	13	12
Ships - Harbor Transit (1)	93	79	695	13	16	15
Ships - Docking (1)	27	24	216	4	5	4
Ships - Hoteling Aux. Sources	28	153	800	60	15	14
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	34	711	541	4	7	6
On-road Trucks	307	1,263	3,231	19	88	81
Trains	177	597	2,514	2	46	46
Railyard Equipment	0	20	3	0	0	0
Commuting	1	41	2	0	1	1
Project Year 2030 Total	**900**	**3,206**	**10,798**	**194**	**232**	**218**
Net Change from 2005 CEQA Baseline	**(325)**	**(1,740)**	**(11,074)**	**(2,892)**	**(843)**	**(790)**
Net Change from NEPA Baseline Year 2030	**211**	**399**	**2,265**	**35**	**46**	**44**
SCAQMD Daily Significance Thresholds	55	550	55	150	150	55

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-22. Maximum Ambient Pollutant Impacts – Unmitigated Operations from the 345-Acre Alternative

Pollutant	Averaging Time	Maximum Impact from Unmitigated Project Emissions ($\mu g/m^3$)	Background Pollutant Concentration ($\mu g/m^3$)	Total Maximum Unmitigated Project Impact ($\mu g/m^3$) [a]	SCAQMD Significance Threshold ($\mu g/m^3$)
NO_2 [b]	1-hour	308	226	**534**	338
	Annual	9	53	**62**	56
CO	1-hour	260	4,667	4,927	23,000
	8-hour	80	3,778	3,858	10,000
		Maximum Impact from Unmitigated Project Emissions ($\mu g/m^3$)	**Maximum Impact from CEQA Baseline Emissions ($\mu g/m^3$)**	**Maximum CEQA Increment ($\mu g/m^3$) [a,c]**	**SCAQMD Significance Threshold ($\mu g/m^3$)**
PM_{10} [a]	24-hour	3.60	3.46	0.14	2.5
$PM_{2.5}$ [a]	24-hour	3.49	3.34	0.14	2.5
		Maximum Impact from Unmitigated Project Emissions ($\mu g/m^3$)	**Maximum Impact from NEPA Baseline Emissions ($\mu g/m^3$)**	**Maximum NEPA Increment ($\mu g/m^3$) [a,d]**	**SCAQMD Significance Threshold ($\mu g/m^3$)**
PM_{10} [a]	24-hour	3.69	2.69	0.99	2.5
$PM_{2.5}$ [a]	24-hour	3.47	2.59	0.89	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Project Alternative emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Project emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NO_x to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD, 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impact are closer than 500 m from this location.

c. Equal to Project impact minus CEQA Baseline impact.

d. Equal to Project impact minus NEPA Baseline impact.

Table 3.2-23. Maximum Ambient Pollutant Impacts – Mitigated Operations from the 345-Acre Alternative

Pollutant	Averaging Time	Maximum Impact from Mitigated Project Emissions (µg/m^3)	Background Pollutant Concentration (µg/m^3)	Total Maximum Mitigated Project Impact (µg/m^3) [a]	SCAQMD Significance Threshold (µg/m^3)
NO_2 [b]	1-hour	289	226	**515**	338
	Annual	7	53	**60**	56
CO	1-hour	223	4,667	4,890	23,000
	8-hour	72	3,778	3,850	10,000
		Maximum Impact from Mitigated Project Emissions (µg/m^3)	**Maximum Impact from CEQA Baseline Emissions (µg/m^3)**	**Maximum CEQA Increment (µg/m^3) [a,c]**	**SCAQMD Significance Threshold (µg/m^3)**
PM_{10} [a]	24-hour	1.18	1.16	0.03	2.5
$PM_{2.5}$ [a]	24-hour	1.14	1.11	0.03	2.5
		Maximum Impact from Mitigated Project Emissions (µg/m^3)	**Maximum Impact from NEPA Baseline Emissions (µg/m^3)**	**Maximum NEPA Increment (µg/m^3) [a,d]**	**SCAQMD Significance Threshold (µg/m^3)**
PM_{10} [a]	24-hour	2.84	2.73	0.12	2.5
$PM_{2.5}$ [a]	24-hour	4.40	4.33	0.07	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Project Alternative emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Project emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NO_x to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD, 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impact are closer than 500 m from this location.

c. Equal to Project impact minus CEQA Baseline impact.

d. Equal to Project impact minus NEPA Baseline impact.

Table 3.2-24. Maximum Health Impacts Estimated for Unmitigated Construction and Operations from the 345-Acre Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Proposed Project	CEQA Baseline	CEQA Increment[2]	Proposed Project	NEPA Baseline	NEPA Increment [2,3]	
Cancer Risk	Residential	2×10^{-6}	7×10^{-6}	-5×10^{-6}	33×10^{-6}	24×10^{-6}	9×10^{-6}	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	52×10^{-6}	36×10^{-6}	$\mathbf{16 \times 10^{-6}}$	
	Sensitive	1×10^{-6}	3×10^{-6}	-2×10^{-6}	26×10^{-6}	19×10^{-6}	7×10^{-6}	
Chronic Hazard Index	Residential	0.013	0.013	0.0004	0.069	0.018	0.051	1.0
	Occupational	0.368	0.138	0.230	0.368	0.038	0.330	
	Sensitive	0.004	0.008	-0.004	0.026	0.015	0.011	
Acute Hazard Index	Residential	0.111	0.099	0.012	0.218	0.167	0.051	1.0
	Occupational	0.650	0.515	0.135	0.883	0.622	0.261	
	Sensitive	0.092	0.086	0.007	0.189	0.146	0.043	

Notes:

1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact. Consequently, the risk numbers for the proposed project and the CEQA and NEPA baseline are not constant, but rather would differ as they would correspond to values for the location of predicted maximum cancer and non-cancer risk increment value.
2. The CEQA Increment represents proposed Project impact minus CEQA Baseline impact. The NEPA Increment represents proposed Project impact minus NEPA Baseline impact.
3. Exceedances of the significance criteria are in bold. The significance thresholds for cancer risk and chronic hazard index only apply to the CEQA and NEPA increment values.

Table 3.2-25. Maximum Health Impacts Estimated for Mitigated Construction and Operations from the 345-Acre Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Proposed Project	CEQA Baseline	CEQA Increment[2]	Proposed Project	NEPA Baseline	NEPA Increment[2,3]	
Cancer Risk	Residential	1×10^{-6}	7×10^{-6}	-6×10^{-6}	40×10^{-6}	32×10^{-6}	8×10^{-6}	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	41×10^{-6}	32×10^{-6}	9×10^{-6}	
	Sensitive	1×10^{-6}	3×10^{-6}	-2×10^{-6}	23×10^{-6}	19×10^{-6}	4×10^{-6}	
Chronic Hazard Index	Residential	0.004	0.005	-0.001	0.057	0.018	0.039	1.0
	Occupational	0.317	0.111	0.206	0.338	0.038	0.300	
	Sensitive	0.002	0.008	-0.006	0.017	0.015	0.002	
Acute Hazard Index	Residential	0.089	0.096	-0.007	0.172	0.158	0.014	1.0
	Occupational	0.457	0.460	-0.003	0.695	0.622	0.073	
	Sensitive	0.074	0.080	-0.006	0.132	0.122	0.010	

Notes:
1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact. Consequently, the risk numbers for the proposed Project and the CEQA and NEPA baselines are not constant, but rather would differ as they would correspond to values for the location of predicted maximum cancer and non-cancer risk increment values.
2. The CEQA Increment represents proposed Project impact minus CEQA Baseline impact. The NEPA Increment represents proposed Project impact minus NEPA Baseline impact.
3. Exceedances of the significance criteria are in bold. The significance thresholds for cancer risk and chronic hazard index only apply to the CEQA and NEPA increment values.

Table 3.2-26. Annual 2005 Statewide PM and Ozone Health Effects Associated with Ports and Goods Movement in California[1]

Health Outcome	Cases Per Year	Uncertainty Range (Cases per Year) [2]
Premature Death	2,400	720 to 4,100
Hospital Admissions (respiratory causes)	2,000	1,200 to 2,800
Hospital Admissions (cardiovascular causes)	830	530 to 1,300
Asthma and Other Lower Respiratory Symptoms	62,000	24,000 to 99,000
Acute Bronchitis	5,100	-1,200 to 11,000
Work Loss Days	360,000	310,000 to 420,000
Minor Restricted Activity Days	3,900,000	2,200,000 to 5,800,000
School Absence Days	1,100,000	460,000 to 1,800,000

Notes:
1. Does not include the contributions from particle sulfate formed from SO_x emissions, which is being addressed with several ongoing emissions, measurement, and modeling studies.
2. Range reflects uncertainty in health concentration-response functions, but not in emissions or exposure estimates. A negative value as a lower bound of the uncertainty range is not meant to imply that exposure to pollutants is beneficial; rather, it is a reflection of the adequacy of the data used to develop these uncertainty range estimates.

Table 3.2-27. GHG Emissions Produced from Construction of the 345-Acre Alternative

Construction Phase/Stage	Total Emissions (Metric Tons)			
	CO_2	CH_4	N_2O	CO_2e
Phase 1 / Stage 1	33,810	5.0	0.4	34,024
Phase 1 / Stage 2	7,938	1.2	0.1	7,988
Phase 1 / Stage 3	14,658	2.2	0.2	14,753
Phase 1 / Stage 4	5,346	0.9	0.1	5,383
Phase 1 / Stage 5	4,067	0.7	0.1	4,095
Phase 2 / Stage 1	11,595	1.8	0.1	11,671
Phase 2 / Stage 2	24,778	4.0	0.3	24,934
Phase 2 / Stage 3	5,903	0.9	0.1	5,943
Total Emissions	**108,095**	**16.6**	**1.4**	**108,790**

Notes:

One metric ton equals 1000 kilograms, 2205 lbs, or 1.1 U.S. (short) tons.

CO_2e = the carbon dioxide equivalent emissions of all GHG combined. The carbon dioxide equivalent emission rate for each GHG represents the emission rate multiplied by its GWP. The GWPs are 1 for CO_2; 21 for CH_4; and 310 for N_2O.

Table 3.2-28. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 1

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N^2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2010							
Ships - Fairway Transit (1)	62,852	8.33	0.56	-	-	-	63,201
Ships - Precautionary Area Transit (1)	1,902	0.25	0.02	-	-	-	1,913
Ships - Harbor Transit (1)	1,529	0.21	0.01	-	-	-	1,537
Ships - Docking (1)	512	0.07	0.00	-	-	-	515
Ships - Hoteling Aux. Sources	14,719	1.98	0.11	-	-	-	14,793
Ships Sub Total	81,514	10.84	0.70	-	-	-	81,958
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	15,935	2.30	0.16	-	-	-	16,034
On-road Trucks	147,386	27.31	13.66	-	-	-	152,194
Trains	5,016	0.70	0.05	-	-	-	5,046
Railyard Equipment	193	0.03	0.00	-	-	-	194
Commuting	2,035	0.37	0.36	-	-	-	2,155
Cold-Iron Usage	5,422	0.045	0.025	-	-	-	5,431
Reefers Refrigerant Losses	-	-	-	0.07	0.18	0.08	817
On-Terminal Electrical Consumption	16,277	0.14	0.07	-	-	-	16,303
Project Year 2010 Total	**274,320**	**42**	**15**	**0.07**	**0.18**	**0.08**	**280,676**
Net Change from 2005 CEQA Baseline	**90,475**	**5**	**(2)**	**0.02**	**0.04**	**0.02**	**90,305**
Net Change from NEPA Baseline Year 2010	**55,697**	**7**	**1**	**0.002**	**0.01**	**0.003**	**56,147**
Project Year 2015							
Ships - Fairway Transit (1)	79,004	10.47	0.70	-	-	-	79,443
Ships - Precautionary Area Transit (1)	2,409	0.32	0.02	-	-	-	2,422
Ships - Harbor Transit (1)	1,924	0.26	0.02	-	-	-	1,935
Ships - Docking (1)	643	0.09	0.01	-	-	-	646
Ships - Hoteling Aux. Sources	11,412	1.52	0.07	-	-	-	11,464
Ships Sub Total	95,392	12.66	0.81	-	-	-	95,910
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	18,495	2.67	0.19	-	-	-	18,609
On-road Trucks	123,366	23.50	11.75	-	-	-	127,501
Trains	65,608	9.19	0.65	-	-	-	66,001
Railyard Equipment	2,845	0.41	0.03	-	-	-	2,863
Commuting	2,353	0.43	0.42	-	-	-	2,491
Cold-Iron Usage	3,250	0.027	0.015	-	-	-	3,256
Reefers Refrigerant Losses	-	-	-	0.10	0.23	0.10	1,084
On-Terminal Electrical Consumption	24,089	0.20	0.11	-	-	-	24,128
Project Year 2015 Total	**336,075**	**49**	**14**	**0.10**	**0.23**	**0.10**	**342,523**
Net Change from 2005 CEQA Baseline	**152,230**	**13**	**(3)**	**0.04**	**0.10**	**0.04**	**152,152**
Net Change from NEPA Baseline Year 2015	**54,992**	**6**	**(1)**	**0.002**	**0.005**	**0.002**	**54,709**

Note: 1. Includes auxiliary generator emissions.

Table 3.2-28. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 1 (continued)							
Project Scenario/Source Type	**Metric Tons Per Year**						
	CO_2	**CH_4**	**N^2O**	**HFC-125**	**HFC-134a**	**HFC-143a**	**CO_2e**
Project Year 2020							
Ships - Fairway Transit (1)	101,154	13.41	0.90	-	-	-	101,716
Ships - Precautionary Area Transit (1)	3,113	0.42	0.03	-	-	-	3,130
Ships - Harbor Transit (1)	2,577	0.35	0.02	-	-	-	2,592
Ships - Docking (1)	865	0.12	0.01	-	-	-	870
Ships - Hoteling Aux. Sources	9,341	1.22	0.04	-	-	-	9,378
Ships Sub Total	117,050	15.52	1.00	-	-	-	117,685
Tugboats - Cargo Vessel Assist (1)	812	0.11	0.01	-	-	-	817
Terminal Equipment	21,836	3.15	0.22	-	-	-	21,971
On-road Trucks	166,034	30.49	15.24	-	-	-	171,399
Trains	83,522	11.70	0.82	-	-	-	84,023
Railyard Equipment	4,087	0.59	0.04	-	-	-	4,112
Commuting	2,710	0.50	0.48	-	-	-	2,869
Cold-Iron Usage	6,757	0.056	0.031	-	-	-	6,768
Reefers Refrigerant Losses	-	-	-	0.13	0.30	0.13	1,395
On-Terminal Electrical Consumption	32,738	0.27	0.15	-	-	-	32,791
Project Year 2020 Total	**435,547**	**62**	**18**	**0.13**	**0.30**	**0.13**	**443,830**
Net Change from 2005 CEQA Baseline	**251,702**	**26**	**1**	**0.07**	**0.17**	**0.07**	**253,459**
Net Change from NEPA Baseline Year 2020	**105,883**	**14**	**1**	**0.01**	**0.03**	**0.02**	**106,597**
Project Year 2030							
Ships - Fairway Transit (1)	116,571	15.45	1.04	-	-	-	117,218
Ships - Precautionary Area Transit (1)	3,567	0.48	0.03	-	-	-	3,586
Ships - Harbor Transit (1)	2,947	0.40	0.03	-	-	-	2,963
Ships - Docking (1)	989	0.13	0.01	-	-	-	995
Ships - Hoteling Aux. Sources	10,812	1.41	0.04	-	-	-	10,855
Ships Sub Total	134,886	17.88	1.15	-	-	-	135,618
Tugboats - Cargo Vessel Assist (1)	947	0.13	0.01	-	-	-	953
Terminal Equipment	27,973	4.04	0.29	-	-	-	28,146
On-road Trucks	214,700	39.10	19.55	-	-	-	221,583
Trains	82,049	11.49	0.81	-	-	-	82,541
Railyard Equipment	4,407	0.64	0.04	-	-	-	4,434
Commuting	3,595	0.66	0.64	-	-	-	3,806
Cold-Iron Usage	7,702	0.064	0.035	-	-	-	7,714
Reefers Refrigerant Losses	-	-	-	0.15	0.35	0.15	1,627
On-Terminal Electrical Consumption	35,900	0.30	0.17	-	-	-	35,958
Project Year 2030 Total	**512,160**	**74**	**23**	**0.15**	**0.35**	**0.15**	**522,380**
Net Change from 2005 CEQA Baseline	**328,315**	**38**	**6**	**0.09**	**0.22**	**0.10**	**332,008**
Net Change from NEPA Baseline Year 2030	**121,556**	**17**	**2**	**0.02**	**0.04**	**0.02**	**122,622**
Note: 1. Includes auxiliary generator emissions.							

Table 3.2-29. Project Applicability Review of Potential GHG Emission Reduction Strategies

Operational Strategy	Applicability to Proposed Project
Commercial and Industrial Design Features	
Vehicle Climate Change Standards	Regulatory measure implemented by ARB
Diesel Anti-Idling	**Mitigation Measures AQ-9** (locomotives) and **AQ-10** (trucks). Also a regulatory measure implemented by ARB.
Other Light duty Vehicle Technology	**Mitigation Measure AQ-23** (employee carpooling) would reduce commuting emissions. Regulatory measure implemented by ARB (standards will phase in starting 2009)
HFCs Reduction	Future regulatory measure planned by ARB
Transportation Refrigeration Units; Off Road Electrification; Port Electrification	**Mitigation Measure AQ-5** (shore to ship power). **Mitigation Measure 7a** would reduce emission from CHE. Off-loaded reefers are electrified as part of the project; also a future regulatory measure is planned by ARB
Alternative Fuels: Biodiesel blends	Future regulatory measure planned by ARB
Alternative Fuel: Ethanol vehicles or enhanced ethanol/gasoline blends	Future regulatory measure planned by ARB
Heavy Duty Vehicle Emissions Reduction Measures	**Mitigation Measure AQ-8** (Heavy Duty Trucks). Also a regulatory measure implemented by ARB
Slide Valves in OGV	**Mitigation Measure AQ-11 would affect all OGV**
Vessel Speed Reduction within State Waters	**Mitigation Measure AQ-12 would affect all OGV**
Low-Sulfur Fuel in OGV within State Waters	**Mitigation Measure AQ-13 would affect all OGV**
Reduced Venting in Gas Systems	Not applicable to Project
Building Operations Strategy	
Recycling	**Mitigation Measure AQ-18.** Also a regulatory measure implemented by the Integrated Waste Management Board
Building Energy Efficiency	**Mitigation Measures AQ-14, AQ-15, AQ-16, AQ-19, AQ-19a, AQ-20, AQ-21, AQ-22, and AQ-27.** Also a regulatory measure implemented by the California Energy Commission
Green Buildings Initiative	**Mitigation Measures AQ-14 and AQ-20**. Also a future regulatory measure planned by the State and Consumer Services and Cal/EPA
California Solar Initiative	**Mitigation Measures AQ-17 and AQ17a**. Also a future regulatory measure is planned by the California Public Utilities Commission
Offsite and Additional Mitigations	
Green Commodities	**AQ-24** (Mitigation for Indirect GHG Emissions) would partially offset the GHG emissions from the terminal's electrical use
Ability to implement new mitigation measure as they become available	**Mitigation AQ-25** would implement new mitigation measures as they become available through a lease reopening mechanism**.**
Offsite GHG Reduction Program	**Mitigation Measure AQ-28** would reduce Project specific and cumulative GHG impacts from the Project

Note:

These strategies are found in the *California Climate Action Team's report to the Governor* (CalEPA, 2006) and ARB's *Proposed Early Actions to Mitigate Climate Change in California* (ARB 2007).

Table 3.2-30. Annual GHG Emissions due to Operations Within California - Mitigated Alternative 1

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2010							
Ships - Fairway Transit (1)	21,513	2.97	0.21	-	-	-	21,641
Ships - Precautionary Area Transit (1)	1,853	0.25	0.02	-	-	-	1,863
Ships - Harbor Transit (1)	1,515	0.21	0.01	-	-	-	1,524
Ships - Docking (1)	508	0.07	0.00	-	-	-	511
Ships - Hoteling Aux. Sources	11,674	1.56	0.08	-	-	-	11,730
Ships Sub Total	37,063	5.06	0.32	-	-	-	37,269
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	15,935	2.30	0.16	-	-	-	16,034
On-road Trucks	147,386	27.31	13.66	-	-	-	152,194
Trains	5,016	0.70	0.05	-	-	-	5,046
Railyard Equipment	193	0.03	0.00	-	-	-	194
Commuting	2,035	0.37	0.36	-	-	-	2,155
Cold-Iron	1,610	0.013	0.007	-	-	-	1,613
Reefers	-	-	-	0.07	0.18	0.08	817
Terminal Electrical Consumption (2)	16,277	0.14	0.07	-	-	-	16,303
Project Year 2010 Total	**226,057**	**36**	**15**	**0.07**	**0.18**	**0.08**	**232,169**
Net Change from 2005 CEQA Baseline	**42,213**	**(1)**	**(2)**	**0.02**	**0.04**	**0.02**	**41,797**
Net Change from NEPA Baseline Year 2010	**7,434**	**1**	**0**	**0.002**	**0.01**	**0.003**	**7,640**
Project Year 2015							
Ships - Fairway Transit (1)	27,315	3.77	0.27	-	-	-	27,477
Ships - Precautionary Area Transit (1)	2,346	0.32	0.02	-	-	-	2,360
Ships - Harbor Transit (1)	1,907	0.26	0.02	-	-	-	1,918
Ships - Docking (1)	638	0.09	0.01	-	-	-	642
Ships - Hoteling Aux. Sources	6,495	0.84	0.02	-	-	-	6,518
Ships Sub Total	38,701	5.27	0.33	-	-	-	38,914
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	18,495	2.67	0.19	-	-	-	18,609
On-road Trucks	123,366	23.50	11.75	-	-	-	127,501
Trains	65,608	9.19	0.65	-	-	-	66,001
Railyard Equipment	2,845	0.41	0.03	-	-	-	2,863
Commuting	2,353	0.43	0.42	-	-	-	2,491
Cold-Iron	3,250	0.027	0.015	-	-	-	3,256
Reefers	-	-	-	0.10	0.23	0.10	1,084
Terminal Electrical Consumption (2)	24,089	0.20	0.11	-	-	-	24,128
Project Year 2015 Total	**279,384**	**42**	**13**	**0.10**	**0.23**	**0.10**	**285,528**
Net Change from 2005 CEQA Baseline	**95,540**	**5**	**(3)**	**0.04**	**0.10**	**0.04**	**95,157**
Net Change from NEPA Baseline Year 2015	**(1,698)**	**(1)**	**(2)**	**0.002**	**0.00**	**0.002**	**(2,287)**

Note 1. Includes auxiliary generator emissions.
2. Actual emissions would be significantly lower as the analysis did not take any credit for **Mitigation Measure AQ-24** (Mitigation of Indirect GHG Emissions)

Table 3.2-30. Annual GHG Emissions due to Operations Within California - Mitigated Alternative 1 (continued)							
Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2020							
Ships - Fairway Transit (1)	34,997	4.82	0.35	-	-	-	35,205
Ships - Precautionary Area Transit (1)	3,034	0.41	0.03	-	-	-	3,051
Ships - Harbor Transit (1)	2,556	0.35	0.02	-	-	-	2,570
Ships - Docking (1)	859	0.12	0.01	-	-	-	864
Ships - Hoteling Aux. Sources	7,744	1.00	0.02	-	-	-	7,772
Ships Sub Total	49,190	6.71	0.42	-	-	-	49,462
Tugboats - Cargo Vessel Assist (1)	812	0.11	0.01	-	-	-	817
Terminal Equipment	11,921	1.72	0.12	-	-	-	11,995
On-road Trucks	166,034	30.49	15.24	-	-	-	171,399
Trains	83,522	11.70	0.82	-	-	-	84,023
Railyard Equipment	1,614	0.23	0.02	-	-	-	1,624
Commuting	2,710	0.50	0.48	-	-	-	2,869
Cold-Iron + RMG Electrification	13,539	0.113	0.062	-	-	-	13,560
Reefers	-	-	-	0.13	0.30	0.13	1,395
Terminal Electrical Consumption (2)	32,738	0.27	0.15	-	-	-	32,791
Project Year 2020 Total	**362,080**	**52**	**17**	**0.13**	**0.30**	**0.13**	**369,935**
Net Change from 2005 CEQA Baseline	**178,235**	**15**	**1**	**0.07**	**0.17**	**0.07**	**179,563**
Net Change from NEPA Baseline Year 2020	**32,416**	**4**	**0**	**0.01**	**0.03**	**0.02**	**32,701**
Project Year 2030							
Ships - Fairway Transit (1)	40,087	5.53	0.40	-	-	-	40,326
Ships - Precautionary Area Transit (1)	3,477	0.48	0.03	-	-	-	3,496
Ships - Harbor Transit (1)	2,922	0.40	0.03	-	-	-	2,939
Ships - Docking (1)	982	0.13	0.01	-	-	-	988
Ships - Hoteling Aux. Sources	8,992	1.16	0.02	-	-	-	9,024
Ships Sub Total	56,460	7.70	0.49	-	-	-	56,773
Tugboats - Cargo Vessel Assist (1)	947	0.13	0.01	-	-	-	953
Terminal Equipment	14,538	2.10	0.15	-	-	-	14,628
On-road Trucks	214,700	39.10	19.55	-	-	-	221,583
Trains	82,049	11.49	0.81	-	-	-	82,541
Railyard Equipment	1,740	0.25	0.02	-	-	-	1,751
Commuting	3,595	0.66	0.64	-	-	-	3,806
Cold-Iron + RMG Electrification	16,381	0.136	0.075	-	-	-	16,407
Reefers	-	-	-	0.15	0.35	0.15	1,627
Terminal Electrical Consumption (2)	35,900	0.30	0.17	-	-	-	35,958
Project Year 2030 Total	**426,311**	**62**	**22**	**0.15**	**0.35**	**0.15**	**436,026**
Net Change from 2005 CEQA Baseline	**242,467**	**25**	**5**	**0.09**	**0.22**	**0.10**	**245,655**
Net Change from NEPA Baseline Year 2030	**35,707**	**5**	**1**	**0.02**	**0.04**	**0.02**	**36,268**

Note: 1. Includes auxiliary generator emissions.
2. Actual emissions would be significantly lower as the analysis did not take any credit for **Mitigation Measure AQ-24** (Mitigation of Indirect GHG Emissions)

Table 3.2-31. Peak Daily Emissions for Construction of the 315-Acre Alternative

Construction Phase/Stage	Emissions (pounds per day)					
	VOC	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Phase 1 / Stage 1	169	1,109	5,179	15	524	213
Phase 1 / Stage 2	48	362	1,287	5	344	106
Phase 1 / Stage 3	52	340	934	4	801	192
Phase 1 / Stage 4	13	55	174	0	1,247	267
Phase 1 / Stage 5	14	73	175	0	1,247	267
Phase 1 / Stage 6	43	242	610	2	94	38
Peak Daily Emissions – CEQA Impact [1,2,5]	**169**	**1,109**	**5,179**	15	**1,299**	**317**
Mitigated Peak Daily Emissions – CEQA Impact [5]	**169**	**1,109**	**5,179**	15	**557**	**161**
Peak Daily Emissions – NEPA Impact [3,5]	**169**	**1,109**	**5,179**	15	**341**	**103**
Mitigated Peak Daily Emissions – NEPA Impact [4,5]	**169**	**1,109**	**5,179**	15	135	41
SCAQMD Daily Significance Thresholds	75	550	100	150	150	55

Notes:

1. Peak daily construction emissions of all pollutants except PM10/PM2.5 would occur during Phase 1/Stage 1 and due to (a) excavation fronting E24, (b) construct new armor slope, (c) E 24 wharf construction, (d) fill within dike, (e) excavate & truck material in cell bulkhead and fronting pier D, (f) demo - E12-13 wharf, (g) lift #1 (~ -30), and (h) commuting of workers.
2. Peak daily construction emissions of PM_{10}/$PM_{2.5}$ would mainly occur as fugitive dust during Phase 1/Stage 4 through Phase 1/Stage 6 and due to (a) Seaside Railyard area redevelopment, (b) new container yard construction, (c) berth F6-F10 wharf improvements, and (d) commuting of workers.
3. Equal to Alternative 2 construction emissions in this table minus NEPA Baseline construction emissions presented in Table 3.2-10.
4. Equal to Alternative 2 mitigated construction emissions minus NEPA Baseline mitigated construction emissions.
5. Bolded data represents an exceedance of a SCAQMD emission threshold.

Table 3.2-32. Maximum Ambient Pollutant Impacts – Unmitigated Construction Activities from the 315-Acre Alternative

Pollutant	Averaging Time	Maximum Alternative 2 Impact [a] (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Alternative 2 Impact + Background [a] (µg/m³)	SCAQMD Threshold (µg/m³)
NO_2 [d]	1-hour	84	226	310	338
CO	1-hour	687	4,667	5,354	23,000
	8-hour	119	3,778	3,897	10,000
PM_{10} [a]	24-hour	**34.5**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	7.5	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and therefore only impacts from Project emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and, therefore, impacts from Alternative 2 emissions plus background pollutant concentrations are compared to the thresholds.
b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.
c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005c). Offsite emissions from tugboats/barges and trucks are addressed under Impact AQ-1.
d. NO2 concentrations were calculated assuming a 46.7 percent conversion rate from NOx to NO2 (SCAQMD 2003c). This conversion rate assumes the maximum impact locations occur within 1000 meters of emission sources that contribute to this impact.

Table 3.2-33. Maximum Ambient Pollutant Impacts – Mitigated Construction Activities from the 315-Acre Alternative

Pollutant	Averaging Time	Maximum Alternative 2 Impact [a] (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Alternative 2 Impact + Background [a] (µg/m³)	SCAQMD Threshold (µg/m³)
NO_2 [d]	1-hour	84	226	310	338
CO	1-hour	687	4,667	5,354	23,000
	8-hour	119	3,778	3,897	10,000
PM_{10} [a]	24-hour	**13.6**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	3.0	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and therefore only impacts from Alternative 2 emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and, therefore, impacts from Alternative 2 emissions plus background pollutant concentrations are compared to the thresholds.

b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.

c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005c). Offsite emissions from tugboats/barges and trucks are addressed under **Impact AQ-1**.

d. NO_2 concentrations were calculated assuming a 46.7 percent conversion rate from NO_x to NO_2 (SCAQMD, 2003c). This conversion rate assumes the maximum impact locations occur within 1000 m of emission sources that contribute to this impact.

Table 3.2-34. Average Daily Operational Emissions Associated with the Unmitigated 315-Acre Alternative

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	80	122	1,092	339	68	64
Ships - Precautionary Area Transit (1)	27	41	334	112	22	21
Ships - Harbor Transit (1)	31	35	293	89	22	20
Ships - Docking (1)	12	12	106	30	8	7
Ships - Hoteling Aux. Sources	47	136	1,379	851	92	86
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	35	215	934	1	29	26
On-road Trucks	408	1,586	7,919	8	61	56
Trains	13	33	177	4	5	4
Railyard Equipment	0	3	10	0	0	0
Commuting	2	77	6	0	0	0
Project Year 2010 Total	**657**	**2,273**	**12,313**	**1,434**	**309**	**288**
Net Change from 2005 CEQA Baseline	**(64)**	**(755)**	**(580)**	**(1,431)**	**(367)**	**(339)**
Net Change from NEPA Baseline Year 2010	**41**	**103**	**2,996**	**1,262**	**189**	**176**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	46	25	24
Ships - Precautionary Area Transit (1)	36	46	406	13	8	7
Ships - Harbor Transit (1)	41	40	354	8	8	7
Ships - Docking (1)	16	14	128	3	3	3
Ships - Hoteling Aux. Sources	32	103	859	39	16	15
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	12	207	217	1	2	2
On-road Trucks	143	655	1,987	7	32	30
Trains	163	451	2,279	2	60	55
Railyard Equipment	2	30	27	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**554**	**1,764**	**7,631**	**119**	**155**	**144**
Net Change from 2005 CEQA Baseline	**(168)**	**(1,264)**	**(5,263)**	**(2,746)**	**(521)**	**(483)**
Net Change from NEPA Baseline Year 2015	**35**	**115**	**929**	**13**	**28**	**26**
Project Year 2020						
Ships - Fairway Transit (1)	110	143	1,386	47	26	25
Ships - Precautionary Area Transit (1)	37	48	423	13	8	8
Ships - Harbor Transit (1)	37	40	352	8	7	7
Ships - Docking (1)	17	15	135	3	3	3
Ships - Hoteling Aux. Sources	15	68	423	26	8	7
Tugboats - Cargo Vessel Assist (1)	2	16	28	0	1	1
Terminal Equipment	14	232	231	1	1	1
On-road Trucks	166	769	1,995	7	43	39
Trains	192	576	2,724	2	70	65
Railyard Equipment	2	40	36	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**593**	**1,990**	**7,736**	**109**	**168**	**156**
Net Change from 2005 CEQA Baseline	**(128)**	**(1,038)**	**(5,158)**	**(2,756)**	**(508)**	**(471)**
Net Change from NEPA Baseline Year 2020	**(32)**	**60**	**120**	**(15)**	**10**	**9**
Project Year 2030						
Ships - Fairway Transit (1)	143	186	1,814	63	34	32
Ships - Precautionary Area Transit (1)	48	62	549	18	11	10
Ships - Harbor Transit (1)	59	56	492	11	11	10
Ships - Docking (1)	22	19	173	3	4	4
Ships - Hoteling Aux. Sources	19	91	542	36	10	10
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	19	297	314	2	3	3
On-road Trucks	164	672	1,721	9	47	43
Trains	169	571	2,405	2	44	40
Railyard Equipment	2	42	40	0	0	0
Commuting	0	34	2	0	1	1
Project Year 2030 Total	**648**	**2,054**	**8,090**	**143**	**166**	**154**
Net Change from 2005 CEQA Baseline	**(73)**	**(974)**	**(4,804)**	**(2,722)**	**(510)**	**(473)**
Net Change from NEPA Baseline Year 2030	**15**	**156**	**495**	**(13)**	**3**	**3**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.
(1) Includes auxiliary generator emissions.

Table 3.2-35. Peak Daily Operational Emissions - Unmitigated Alternative 2

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	105	162	1,496	468	92	86
Ships - Precautionary Area Transit (1)	39	58	459	155	30	28
Ships - Harbor Transit (1)	36	43	352	114	26	24
Ships - Docking (1)	17	17	137	38	10	10
Ships - Hoteling Aux. Sources	117	324	3,431	2,014	228	214
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	140	871	3,789	4	116	106
On-road Trucks	609	2,367	11,816	12	91	84
Trains	39	100	538	12	15	15
Railyard Equipment	1	9	31	0	1	1
Commuting	2	77	6	0	0	0
Project Year 2010 Total	**1,107**	**4,050**	**22,166**	**2,816**	**613**	**572**
Net Change from 2005 CEQA Baseline	**(118)**	**(896)**	**295**	**(270)**	**(461)**	**(437)**
Net Change from NEPA Baseline Year 2010	**133**	**535**	**6,380**	**2,524**	**393**	**367**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	81	46	43
Ships - Precautionary Area Transit (1)	65	84	737	23	15	14
Ships - Harbor Transit (1)	64	68	616	15	13	12
Ships - Docking (1)	30	26	237	5	5	5
Ships - Hoteling Aux. Sources	62	193	1,681	73	31	29
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	36	621	651	4	6	6
On-road Trucks	213	977	2,963	10	48	45
Trains	180	498	2,516	2	66	66
Railyard Equipment	2	33	30	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**855**	**2,842**	**11,900**	**213**	**232**	**221**
Net Change from 2005 CEQA Baseline	**(371)**	**(2,104)**	**(9,972)**	**(2,873)**	**(842)**	**(787)**
Net Change from NEPA Baseline Year 2015	**57**	**185**	**1,619**	**32**	**44**	**43**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	33	133	919	51	17	16
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	42	719	717	4	4	4
On-road Trucks	248	1,147	2,976	11	63	58
Trains	199	597	2,822	2	73	73
Railyard Equipment	3	48	43	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**737**	**2,963**	**9,888**	**144**	**205**	**195**
Net Change from 2005 CEQA Baseline	**(488)**	**(1,983)**	**(11,984)**	**(2,942)**	**(870)**	**(813)**
Net Change from NEPA Baseline Year 2020	**8**	**269**	**842**	**11**	**21**	**22**
Project Year 2030						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	44	186	1,214	72	23	21
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	84	1,330	1,405	7	15	14
On-road Trucks	244	1,003	2,567	14	70	65
Trains	177	597	2,514	2	46	46
Railyard Equipment	3	52	49	0	1	1
Commuting	0	34	2	0	1	1
Project Year 2030 Total	**763**	**3,478**	**10,158**	**172**	**202**	**191**
Net Change from 2005 CEQA Baseline	**(463)**	**(1,468)**	**(11,714)**	**(2,914)**	**(872)**	**(818)**
Net Change from NEPA Baseline Year 2030	**74**	**671**	**1,626**	**13**	**16**	**16**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-36. Average Daily Operational Emissions - Mitigated Alternative 2						
	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	85	110	1,058	41	20	19
Ships - Precautionary Area Transit (1)	29	37	324	14	7	6
Ships - Harbor Transit (1)	33	32	284	11	6	6
Ships - Docking (1)	13	11	102	4	2	2
Ships - Hoteling Aux. Sources	36	107	971	83	20	19
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	23	109	652	1	13	12
On-road Trucks	376	1,622	5,603	8	43	40
Trains	13	33	177	4	5	4
Railyard Equipment	0	1	6	0	0	0
Commuting	2	77	6	0	0	0
Project Year 2010 Total	**612**	**2,153**	**9,248**	**166**	**120**	**111**
Net Change from 2005 CEQA Baseline	**(109)**	**(875)**	**(3,646)**	**(2,699)**	**(557)**	**(516)**
Net Change from NEPA Baseline Year 2010	**(4)**	**(18)**	**(69)**	**(5)**	**(1)**	**(1)**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	46	25	24
Ships - Precautionary Area Transit (1)	36	46	406	13	8	7
Ships - Harbor Transit (1)	41	40	354	8	8	7
Ships - Docking (1)	16	14	128	3	3	3
Ships - Hoteling Aux. Sources	9	56	262	22	5	5
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	12	208	217	1	2	2
On-road Trucks	139	639	1,909	7	32	30
Trains	163	451	2,279	2	60	55
Railyard Equipment	2	30	27	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**528**	**1,702**	**6,956**	**102**	**145**	**134**
Net Change from 2005 CEQA Baseline	**(193)**	**(1,326)**	**(5,938)**	**(2,763)**	**(532)**	**(493)**
Net Change from NEPA Baseline Year 2015	**10**	**52**	**255**	**(4)**	**17**	**16**
Project Year 2020						
Ships - Fairway Transit (1)	110	143	1,386	47	26	25
Ships - Precautionary Area Transit (1)	37	48	423	13	8	8
Ships - Harbor Transit (1)	37	40	352	8	7	7
Ships - Docking (1)	17	15	135	3	3	3
Ships - Hoteling Aux. Sources	9	55	266	22	5	5
Tugboats - Cargo Vessel Assist (1)	2	16	28	0	1	1
Terminal Equipment	6	140	96	1	1	1
On-road Trucks	182	749	2,068	8	39	35
Trains	192	576	2,724	2	70	65
Railyard Equipment	0	17	2	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**593**	**1,843**	**7,484**	**105**	**161**	**149**
Net Change from 2005 CEQA Baseline	**(128)**	**(1,185)**	**(5,410)**	**(2,760)**	**(515)**	**(477)**
Net Change from NEPA Baseline Year 2020	**(31)**	**(87)**	**(132)**	**(20)**	**3**	**3**
Project Year 2030						
Ships - Fairway Transit (1)	143	186	1,814	63	34	32
Ships - Precautionary Area Transit (1)	48	62	549	18	11	10
Ships - Harbor Transit (1)	59	56	492	11	11	10
Ships - Docking (1)	22	19	173	3	4	4
Ships - Hoteling Aux. Sources	12	76	348	30	7	6
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	8	165	126	1	2	1
On-road Trucks	163	205	1,719	10	47	43
Trains	169	571	2,405	2	44	40
Railyard Equipment	0	16	2	0	0	0
Commuting	0	34	2	0	1	1
Project Year 2030 Total	**627**	**1,412**	**7,668**	**138**	**160**	**149**
Net Change from 2005 CEQA Baseline	**(94)**	**(1,616)**	**(5,226)**	**(2,727)**	**(516)**	**(478)**
Net Change from NEPA Baseline Year 2030	**(6)**	**(486)**	**73**	**(18)**	**(3)**	**(3)**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Note: (2) Equal to annual emissions divided by 365 days.						
(1) Includes auxiliary generator emissions.						

Table 3.2-37. Peak Daily Operational Emissions - Mitigated Alternative 2

	Pounds Per Day (2)					
Project Scenario/Source Type	*VOC*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	111	146	1,450	57	28	26
Ships - Precautionary Area Transit (1)	41	53	445	19	9	9
Ships - Harbor Transit (1)	38	40	342	14	8	7
Ships - Docking (1)	18	15	133	5	3	3
Ships - Hoteling Aux. Sources	74	218	1,995	170	41	39
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	92	443	2,644	4	53	49
On-road Trucks	562	2,420	8,361	13	64	59
Trains	39	100	538	12	15	15
Railyard Equipment	1	4	19	0	0	0
Commuting	2	77	6	0	0	0
Project Year 2010 Total	**980**	**3,537**	**16,044**	**293**	**225**	**210**
Net Change from 2005 CEQA Baseline	**(245)**	**(1,409)**	**(5,828)**	**(2,793)**	**(849)**	**(798)**
Net Change from NEPA Baseline Year 2010	**6**	**22**	**258**	**0**	**6**	**5**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	81	46	43
Ships - Precautionary Area Transit (1)	65	84	737	23	15	14
Ships - Harbor Transit (1)	64	68	616	15	13	12
Ships - Docking (1)	30	26	237	5	5	5
Ships - Hoteling Aux. Sources	17	99	489	39	9	9
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	36	623	651	4	6	6
On-road Trucks	208	954	2,848	11	48	44
Trains	180	498	2,516	2	66	66
Railyard Equipment	2	33	30	0	0	0
Commuting	1	64	4	0	0	0
Project Year 2015 Total	**806**	**2,726**	**10,593**	**179**	**211**	**201**
Net Change from 2005 CEQA Baseline	**(420)**	**(2,220)**	**(11,279)**	**(2,907)**	**(864)**	**(808)**
Net Change from NEPA Baseline Year 2015	**7**	**69**	**312**	**(1)**	**23**	**23**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	20	104	555	41	11	10
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	19	433	298	2	4	4
On-road Trucks	272	1,117	3,085	11	57	53
Trains	199	597	2,822	2	73	73
Railyard Equipment	0	20	3	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**722**	**2,591**	**9,174**	**133**	**193**	**184**
Net Change from 2005 CEQA Baseline	**(504)**	**(2,355)**	**(12,698)**	**(2,953)**	**(882)**	**(824)**
Net Change from NEPA Baseline Year 2020	**(7)**	**(103)**	**128**	**(1)**	**9**	**10**
Project Year 2030						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	27	149	750	59	14	13
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	35	737	561	4	7	7
On-road Trucks	244	305	2,563	15	70	64
Trains	177	597	2,514	2	46	46
Railyard Equipment	0	20	3	0	0	0
Commuting	0	34	2	0	1	1
Project Year 2030 Total	**694**	**2,118**	**8,802**	**156**	**185**	**175**
Net Change from 2005 CEQA Baseline	**(532)**	**(2,828)**	**(13,070)**	**(2,930)**	**(889)**	**(833)**
Net Change from NEPA Baseline Year 2030	**4**	**(688)**	**269**	**(2)**	**(0)**	**1**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-38. Maximum Ambient Pollutant Impacts – Unmitigated Operations from the 315-Acre Alternative

Pollutant	Averaging Time	Maximum Impact from Alternative 2 Emissions (µg/m^3)	Background Pollutant Concentration (µg/m^3)	Total Maximum Alternative 2 Impact (µg/m^3) [a]	SCAQMD Threshold (µg/m^3)
NO_2 [b]	1-hour	305	226	**531**	338
	Annual	9	53	**62**	56
CO	1-hour	247	4,667	4,914	23,000
	8-hour	75	3,778	3,853	10,000
		Maximum Impact from Alternative 2 Emissions (µg/m^3)	**Maximum Impact from CEQA Baseline Emissions (µg/m^3)**	**Maximum CEQA Increment (µg/m^3) [a,c]**	**SCAQMD Threshold (µg/m^3)**
PM_{10} [a]	24-hour	3.6	3.5	0.1	2.5
$PM_{2.5}$ [a]	24-hour	3.4	3.3	0.1	2.5
		Maximum Impact from Alternative 2 Emissions (µg/m^3)	**Maximum Impact from NEPA Baseline Emissions (µg/m^3)**	**Maximum NEPA Increment (µg/m^3) [a,d]**	**SCAQMD Threshold (µg/m^3)**
PM_{10} [a]	24-hour	3.6	2.7	0.9	2.5
$PM_{2.5}$ [a]	24-hour	3.5	2.6	0.9	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Alternative 2 emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Alternative 2 emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NO_x to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD, 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impacts are closer than 500 m from this location.

c. Equal to Alternative 2 impact minus CEQA Baseline impact.

d. Equal to Alternative 2 impact minus NEPA Baseline impact.

Table 3.2-39. Maximum Ambient Pollutant Impacts – Mitigated Operations from the 315-Acre Alternative

Pollutant	Averaging Time	Maximum Impact from Alternative 2 Emissions (µg/m^3)	Background Pollutant Concentration (µg/m^3)	Total Maximum Alternative 2 Impact (µg/m^3) [a]	SCAQMD Threshold (µg/m^3)
NO_2 [b]	1-hour	288	226	**514**	338
	Annual	6	53	**59**	56
CO	1-hour	215	4,667	4,882	23,000
	8-hour	70	3,778	3,848	10,000
		Maximum Impact from Alternative 2 Emissions (µg/m^3)	**Maximum Impact from CEQA Baseline Emissions (µg/m^3)**	**Maximum CEQA Increment (µg/m^3) [a,c]**	**SCAQMD Threshold (µg/m^3)**
PM_{10} [a]	24-hour	1.18	1.15	0.02	2.5
$PM_{2.5}$ [a]	24-hour	1.14	1.11	0.03	2.5
		Maximum Impact from Alternative 2 Emissions (µg/m^3)	**Maximum Impact from NEPA Baseline Emissions (µg/m^3)**	**Maximum NEPA Increment (µg/m^3) [a,d]**	**SCAQMD Threshold (µg/m^3)**
PM_{10} [a]	24-hour	3.8	3.7	0.1	2.5
$PM_{2.5}$ [a]	24-hour	2.7	2.6	0.1	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Alternative 2 emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Alternative 2 emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NO_x to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impacts are closer than 500 m from this location.

c. Equal to Alternative 2 impact minus CEQA Baseline impact.

d. Equal to Alternative 2 impact minus NEPA Baseline impact.

Table 3.2-40. Maximum Health Impacts Estimated for Construction and Unmitigated Operations from the 315-Acre Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Alternative 2	CEQA Baseline	CEQA Increment[2]	Alternative 2	NEPA Baseline	NEPA Increment[2]	
Cancer Risk	Residential	2×10^{-6}	7×10^{-6}	-5×10^{-6}	21×10^{-6}	16×10^{-6}	5×10^{-6}	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	51×10^{-6}	36×10^{-6}	**15×10^{-6}**	
	Sensitive	1×10^{-6}	3×10^{-6}	-2×10^{-6}	25×10^{-6}	19×10^{-6}	6×10^{-6}	
Chronic Hazard Index	Residential	0.013	0.013	0.0003	0.068	0.018	0.050	1.0
	Occupational	0.365	0.138	0.227	0.365	0.038	0.327	
	Sensitive	0.004	0.008	-0.004	0.025	0.015	0.010	
Acute Hazard Index	Residential	0.109	0.099	0.010	0.212	0.167	0.045	1.0
	Occupational	0.645	0.515	0.130	0.860	0.622	0.238	
	Sensitive	0.091	0.086	0.005	0.186	0.146	0.040	

Notes:
1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact.
2. The CEQA Increment represents Alternative 2 impact minus CEQA Baseline impact. The NEPA Increment represents Alternative 2 impact minus NEPA Baseline impact.
3. Exceedances of the significance criteria are in bold. The significance thresholds for cancer risk and chronic hazard index only apply to the CEQA and NEPA increment values.

Table 3.2-41. Maximum Health Impacts Estimated for Construction and Mitigated Operations from the 315-Acre Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Mitigated Alternative 2	CEQA Baseline	CEQA Increment[2]	Mitigated Alternative 2	NEPA Baseline	NEPA Increment[2]	
Cancer Risk	Residential	1×10^{-6}	7×10^{-6}	-6×10^{-6}	28×10^{-6}	25×10^{-6}	3×10^{-6}	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	45×10^{-6}	37×10^{-6}	8×10^{-6}	
	Sensitive	1×10^{-6}	3×10^{-6}	-2×10^{-6}	23×10^{-6}	19×10^{-6}	4×10^{-6}	
Chronic Hazard Index	Residential	0.004	0.005	-0.001	0.056	0.018	0.039	1.0
	Occupational	0.316	0.111	0.205	0.337	0.038	0.299	
	Sensitive	0.002	0.008	-0.006	0.016	0.015	0.001	
Acute Hazard Index	Residential	0.038	0.043	-0.005	0.162	0.153	0.009	1.0
	Occupational	0.081	0.082	-0.001	0.676	0.622	0.054	
	Sensitive	0.073	0.080	-0.007	0.129	0.122	0.007	

Notes:
1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact.
2. The CEQA Increment represents Alternative 2 impact minus CEQA Baseline impact. The NEPA Increment represents Alternative 2 impact minus NEPA Baseline impact.
3. Exceedances of the significance criteria are in bold. The significance thresholds for cancer risk and chronic hazard index only apply to the CEQA and NEPA increment values.

Table 3.2-42. GHG Emissions Produced from Construction of the 315-Acre Alternative

Construction Phase/Stage	Total Emissions (Metric Tons)			
	CO_2	CH_4	N_2O	CO_2e
Phase 1 / Stage 1	33,810	5.0	0.4	34,024
Phase 1 / Stage 2	7,938	1.2	0.1	7,988
Phase 1 / Stage 3	14,658	2.2	0.2	14,753
Phase 1 / Stage 4	5,346	0.9	0.1	5,383
Phase 1 / Stage 5	4,067	0.7	0.1	4,095
Phase 1 / Stage 6	16,560	2.5	0.2	16,667
Total Emissions	**82,379**	**13**	**1.0**	**82,910**

Notes:
One metric ton equals 1000 kilograms, 2205 lbs, or 1.1 U.S. (short) tons.
CO_2e = the carbon dioxide equivalent emissions of all GHG combined. The carbon dioxide equivalent emission rate for each GHG represents the emission rate multiplied by its GWP. The GWPs are 1 for CO_2; 21 for CH_4; and 310 for N_2O.

Table 3.2-43. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 2

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2010							
Ships - Fairway Transit (1)	62,852	8.33	0.56	-	-	-	63,201
Ships - Precautionary Area Transit (1)	1,902	0.25	0.02	-	-	-	1,913
Ships - Harbor Transit (1)	1,529	0.21	0.01	-	-	-	1,537
Ships - Docking (1)	512	0.07	0.00	-	-	-	515
Ships - Hoteling Aux. Sources	14,719	1.98	0.11	-	-	-	14,793
Ships Sub Total	81,514	10.84	0.70	-	-	-	81,958
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	15,224	2.20	0.16	-	-	-	15,318
On-road Trucks	147,971	26.54	13.27	-	-	-	152,641
Trains	4,777	0.67	0.05	-	-	-	4,806
Railyard Equipment	185	0.03	0.00	-	-	-	186
Commuting	1,824	0.33	0.32	-	-	-	1,931
Cold-Iron	5,422	0.045	0.025	-	-	-	5,431
Reefers	-	-	-	0.07	0.17	0.07	781
Terminal Electrical Consumption	15,565	0.13	0.07	-	-	-	15,590
Project Year 2010 Total	**273,023**	**41**	**15**	**0.07**	**0.17**	**0.07**	**279,188**
Net Change from 2005 CEQA Baseline	**89,178**	**4**	**(2)**	**0.01**	**0.03**	**0.02**	**88,816**
Net Change from NEPA Baseline Year 2010	**54,400**	**6**	**0**	**(0.001)**	**(0.002)**	**(0.001)**	**54,659**
Project Year 2015							
Ships - Fairway Transit (1)	79,004	10.47	0.70	-	-	-	79,443
Ships - Precautionary Area Transit (1)	2,409	0.32	0.02	-	-	-	2,422
Ships - Harbor Transit (1)	1,924	0.26	0.02	-	-	-	1,935
Ships - Docking (1)	643	0.09	0.01	-	-	-	646
Ships - Hoteling Aux. Sources	11,412	1.52	0.07	-	-	-	11,464
Ships Sub Total	95,392	12.66	0.81	-	-	-	95,910
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	18,267	2.64	0.19	-	-	-	18,380
On-road Trucks	120,787	23.01	11.51	-	-	-	124,838
Trains	65,807	9.21	0.65	-	-	-	66,201
Railyard Equipment	2,811	0.41	0.03	-	-	-	2,829
Commuting	2,327	0.43	0.41	-	-	-	2,464
Cold-Iron	3,250	0.027	0.015	-	-	-	3,256
Reefers	-	-	-	0.10	0.23	0.10	1,071
Terminal Electrical Consumption	23,800	0.20	0.11	-	-	-	23,838
Project Year 2015 Total	**333,118**	**49**	**14**	**0.10**	**0.23**	**0.10**	**339,466**
Net Change from 2005 CEQA Baseline	**149,274**	**12**	**(3)**	**0.04**	**0.10**	**0.04**	**149,095**
Net Change from NEPA Baseline Year 2015	**52,035**	**6**	**(2)**	**0.001**	**0.002**	**0.001**	**51,652**

Note: 1. Includes auxiliary generator emissions.

Table 3.2-43. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 2 (continued)

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2020							
Ships - Fairway Transit (1)	81,087	10.75	0.72	-	-	-	81,537
Ships - Precautionary Area Transit (1)	2,520	0.34	0.02	-	-	-	2,534
Ships - Harbor Transit (1)	2,050	0.28	0.02	-	-	-	2,062
Ships - Docking (1)	685	0.09	0.01	-	-	-	689
Ships - Hoteling Aux. Sources	7,702	1.01	0.03	-	-	-	7,732
Ships Sub Total	94,043	12.46	0.80	-	-	-	94,553
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	19,031	2.75	0.19	-	-	-	19,149
On-road Trucks	131,616	24.18	12.09	-	-	-	135,872
Trains	84,159	11.78	0.83	-	-	-	84,664
Railyard Equipment	3,571	0.52	0.04	-	-	-	3,593
Commuting	2,328	0.43	0.41	-	-	-	2,465
Cold-Iron	5,456	0.045	0.025	-	-	-	5,465
Reefers	-	-	-	0.11	0.26	0.12	1,218
Terminal Electrical Consumption	28,606	0.24	0.13	-	-	-	28,651
Project Year 2020 Total	**369,486**	**52**	**15**	**0.11**	**0.26**	**0.12**	**376,310**
Net Change from 2005 CEQA Baseline	**185,641**	**16**	**(2)**	**0.05**	**0.13**	**0.06**	**185,938**
Net Change from NEPA Baseline Year 2020	**39,882**	**5**	**(3)**	**(0.001)**	**(0.003)**	**(0.002)**	**39,076**
Project Year 2030							
Ships - Fairway Transit (1)	107,337	14.23	0.96	-	-	-	107,932
Ships - Precautionary Area Transit (1)	3,280	0.44	0.03	-	-	-	3,297
Ships - Harbor Transit (1)	2,598	0.35	0.02	-	-	-	2,612
Ships - Docking (1)	866	0.12	0.01	-	-	-	871
Ships - Hoteling Aux. Sources	10,420	1.36	0.04	-	-	-	10,461
Ships Sub Total	124,500	16.49	1.05	-	-	-	125,174
Tugboats - Cargo Vessel Assist (1)	947	0.13	0.01	-	-	-	953
Terminal Equipment	24,125	3.48	0.25	-	-	-	24,274
On-road Trucks	170,337	31.03	15.52	-	-	-	175,799
Trains	83,403	11.68	0.82	-	-	-	83,903
Railyard Equipment	3,810	0.55	0.04	-	-	-	3,833
Commuting	2,958	0.54	0.52	-	-	-	3,132
Cold-Iron	6,872	0.057	0.032	-	-	-	6,883
Reefers	-	-	-	0.13	0.30	0.13	1,407
Terminal Electrical Consumption	31,034	0.26	0.14	-	-	-	31,084
Project Year 2030 Total	**447,987**	**64**	**18**	**0.13**	**0.30**	**0.13**	**456,442**
Net Change from 2005 CEQA Baseline	**264,142**	**28**	**2**	**0.07**	**0.17**	**0.07**	**266,070**
Net Change from NEPA Baseline Year 2030	**57,383**	**7**	**(3)**	**(0.002)**	**(0.004)**	**(0.002)**	**56,684**

Note: 1. Includes auxiliary generator emissions.

Table 3.2-44. Annual GHG Emissions due to Operations Within California - Mitigated Alternative 2							
Project Scenario/Source Type	**Metric Tons Per Year**						
	CO_2	**CH_4**	**N_2O**	**HFC-125**	**HFC-134a**	**HFC-143a**	**CO_2e**
Project Year 2010							
Ships - Fairway Transit (1)	21,513	2.97	0.21	-	-	-	21,641
Ships - Precautionary Area Transit (1)	1,853	0.25	0.02	-	-	-	1,863
Ships - Harbor Transit (1)	1,515	0.21	0.01	-	-	-	1,524
Ships - Docking (1)	508	0.07	0.00	-	-	-	511
Ships - Hoteling Aux. Sources	11,674	1.56	0.08	-	-	-	11,730
Ships Sub Total	37,063	5.06	0.32	-	-	-	37,269
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	15,224	2.20	0.16	-	-	-	15,318
On-road Trucks	147,971	26.54	13.27	-	-	-	152,641
Trains	4,777	0.67	0.05	-	-	-	4,806
Railyard Equipment	185	0.03	0.00	-	-	-	186
Commuting	1,824	0.33	0.32	-	-	-	1,931
Cold-Iron	1,610	0.013	0.007	-	-	-	1,613
Reefers	-	-	-	0.07	0.17	0.07	781
Terminal Electrical Consumption	15,565	0.13	0.07	-	-	-	15,590
Project Year 2010 Total	**224,760**	**35**	**14**	**0.07**	**0.17**	**0.07**	**230,680**
Net Change from 2005 CEQA Baseline	**40,916**	**(2)**	**(2)**	**0.01**	**0.03**	**0.02**	**40,309**
Net Change from NEPA Baseline Year 2010	**6,137**	**0**	**0**	**(0.001)**	**(0.002)**	**(0.001)**	**6,151**
Project Year 2015							
Ships - Fairway Transit (1)	27,315	3.77	0.27	-	-	-	27,477
Ships - Precautionary Area Transit (1)	2,346	0.32	0.02	-	-	-	2,360
Ships - Harbor Transit (1)	1,907	0.26	0.02	-	-	-	1,918
Ships - Docking (1)	638	0.09	0.01	-	-	-	642
Ships - Hoteling Aux. Sources	6,495	0.84	0.02	-	-	-	6,518
Ships Sub Total	38,701	5.27	0.33	-	-	-	38,914
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	18,267	2.64	0.19	-	-	-	18,380
On-road Trucks	120,787	23.01	11.51	-	-	-	124,838
Trains	65,807	9.21	0.65	-	-	-	66,201
Railyard Equipment	2,811	0.41	0.03	-	-	-	2,829
Commuting	2,327	0.43	0.41	-	-	-	2,464
Cold-Iron	3,250	0.027	0.015	-	-	-	3,256
Reefers	-	-	-	0.10	0.23	0.10	1,071
Terminal Electrical Consumption	23,800	0.20	0.11	-	-	-	23,838
Project Year 2015 Total	**276,428**	**41**	**13**	**0.10**	**0.23**	**0.10**	**282,471**
Net Change from 2005 CEQA Baseline	**92,583**	**5**	**(3)**	**0.04**	**0.10**	**0.04**	**92,100**
Net Change from NEPA Baseline Year 2015	**(4,655)**	**(1)**	**(2)**	**0.001**	**0.002**	**0.001**	**(5,344)**

Note: 1. Includes auxiliary generator emissions.

Table 3.2-44. Annual GHG Emissions due to Operations Within California - Mitigated Alternative 2 (continued)

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2020							
Ships - Fairway Transit (1)	28,431	3.92	0.28	-	-	-	28,600
Ships - Precautionary Area Transit (1)	2,455	0.34	0.02	-	-	-	2,469
Ships - Harbor Transit (1)	2,033	0.28	0.02	-	-	-	2,044
Ships - Docking (1)	680	0.09	0.01	-	-	-	684
Ships - Hoteling Aux. Sources	6,412	0.83	0.02	-	-	-	6,435
Ships Sub Total	40,011	5.46	0.34	-	-	-	40,233
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	10,409	1.50	0.11	-	-	-	10,474
On-road Trucks	131,616	24.18	12.09	-	-	-	135,872
Trains	84,159	11.78	0.83	-	-	-	84,664
Railyard Equipment	1,410	0.20	0.01	-	-	-	1,419
Commuting	2,328	0.43	0.41	-	-	-	2,465
Cold-Ironing + RMG Electrification	11,305	0.094	0.052	-	-	-	11,323
Reefers	-	-	-	0.11	0.26	0.12	1,218
Terminal Electrical Consumption	28,606	0.24	0.13	-	-	-	28,651
Project Year 2020 Total	**310,521**	**44**	**14**	**0.11**	**0.26**	**0.12**	**316,999**
Net Change from 2005 CEQA Baseline	**126,676**	**7**	**(3)**	**0.05**	**0.13**	**0.06**	**126,628**
Net Change from NEPA Baseline Year 2020	**(19,143)**	**(4)**	**(3)**	**(0.001)**	**(0.003)**	**(0.002)**	**(20,235)**
Project Year 2030							
Ships - Fairway Transit (1)	37,174	5.13	0.37	-	-	-	37,396
Ships - Precautionary Area Transit (1)	3,194	0.44	0.03	-	-	-	3,212
Ships - Harbor Transit (1)	2,575	0.35	0.02	-	-	-	2,589
Ships - Docking (1)	860	0.12	0.01	-	-	-	865
Ships - Hoteling Aux. Sources	8,796	1.14	0.02	-	-	-	8,827
Ships Sub Total	52,599	7.17	0.45	-	-	-	52,888
Tugboats - Cargo Vessel Assist (1)	947	0.13	0.01	-	-	-	953
Terminal Equipment	12,560	1.81	0.13	-	-	-	12,638
On-road Trucks	170,337	31.03	15.52	-	-	-	175,799
Trains	83,403	11.68	0.82	-	-	-	83,903
Railyard Equipment	1,504	0.22	0.02	-	-	-	1,514
Commuting	2,958	0.54	0.52	-	-	-	3,132
Cold-Ironing + RMG Electrification	14,378	0.120	0.066	-	-	-	14,401
Reefers	-	-	-	0.13	0.30	0.13	1,407
Terminal Electrical Consumption	31,034	0.26	0.14	-	-	-	31,084
Project Year 2030 Total	**369,721**	**53**	**18**	**0.13**	**0.30**	**0.13**	**377,718**
Net Change from 2005 CEQA Baseline	**185,877**	**16**	**1**	**0.07**	**0.17**	**0.07**	**187,347**
Net Change from NEPA Baseline Year 2030	**(20,883)**	**(4)**	**(3)**	**(0.002)**	**(0.004)**	**(0.002)**	**(22,040)**

Note: 1. Includes auxiliary generator emissions.

Table 3.2-45. Daily Emissions for Construction of the Landside Improvements Alternative

Construction Phase/Stage	Emissions (pounds per day)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Phase 1 / Stage 1	12	49	173	0	456	103
Phase 1 / Stage 2	5	46	47	0	303	68
Phase 1 / Stage 3	12	49	173	0	779	171
Phase 1 / Stage 4	13	55	174	0	1,249	269
Phase 1 / Stage 5	14	73	175	0	1,251	271
Phase 2 / Stage 1	12	49	173	0	545	117
Phase 2 / Stage 4	6	37	75	0	34	9
Peak Daily Emissions [1,2,3]	24	120	**347**	1	**1,257**	**280**
Mitigated Peak Daily Emissions [3]	24	120	**347**	1	**515**	**132**
SCAQMD Daily Significance Thresholds	75	550	100	150	150	55

Notes:
1. Peak daily construction emissions of all pollutants except PM10/$PM_{2.5}$ would occur during Phase 1/Stage 3 through Phase 1/Stage 5 in association with (a) container yard development, (b) Seaside railyard area redevelopment, and/or, (c) new container yard construction, and (d) commuting of workers.
2. Peak daily construction emissions of PM_{10}/$PM_{2.5}$ would mainly occur as fugitive dust during Phase 1/Stage 4, Phase 1/Stage 5, and Phase 2/Stage 2 in associated with (a) Seaside railyard area redevelopment, (b) new container yard construction, (c) new terminal building construction, and (e) commuting of workers.
3. Bolded data represents an exceedance of a SCAQMD emission threshold.

Table 3.2-46. Maximum Ambient Pollutant Impacts – Unmitigated Construction Activities from the Landside Improvements Alternative

Pollutant	Averaging Time	Maximum Alternative 3 Impact [a] ($\mu g/m^3$)	Background Pollutant Concentration ($\mu g/m^3$)	Maximum Alternative 3 Impact + Background ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [d]	1-hour	70	226	296	338
CO	1-hour	25	4,667	4,692	23,000
	8-hour	3	3,778	3,781	10,000
PM_{10} [a]	24-hour	**34.5**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	7.5	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and therefore only impacts from Project emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and, therefore, impacts from Alternative 3 emissions plus background pollutant concentrations are compared to the thresholds.

b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.

c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005c). Offsite emissions from tugboats/barges and trucks are addressed under **Impact AQ-1**.

d. NO_2 concentrations were calculated assuming a 46.7 percent conversion rate from NOx to NO_2 (SCAQMD 2003c). This conversion rate assumes the maximum impact locations occur within 1000 meters of emission sources that contribute to this impact.

Table 3.2-47. Maximum Ambient Pollutant Impacts – Mitigated Construction Activities from the Landside Improvements Alternative

Pollutant	Averaging Time	Maximum Alternative 3 Impact [a] ($\mu g/m^3$)	Background Pollutant Concentration ($\mu g/m^3$)	Maximum Alternative 3 Impact + Background ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [d]	1-hour	70	226	296	338
CO	1-hour	25	4,667	4,692	23,000
	8-hour	3	3,778	3,781	10,000
PM_{10} [a]	24-hour	**13.6**	-	-	10.4
$PM_{2.5}$ [a]	24-hour	3.0	-	-	10.4

Notes:

a. Exceedances of the thresholds are indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental thresholds and therefore only impacts from Alternative 3 emissions without background pollutant concentrations are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and, therefore, impacts from Alternative 3 emissions plus background pollutant concentrations are compared to the thresholds.

b. Construction schedules are assumed to be eight hours per day, five days per week, and 52 weeks per year.

c. As recommended by the SCAQMD, tugboat/barge emissions and offsite haul truck transport emissions are considered offsite emissions and were not included in the modeling. However, onsite truck emissions were included in the modeling (SCAQMD 2005c). Offsite emissions from tugboats/barges and trucks are addressed under **Impact AQ-1**.

d. NO_2 concentrations were calculated assuming a 46.7 percent conversion rate from NOx to NO_2 (SCAQMD 2003c). This conversion rate assumes the maximum impact locations occur within 1000 meters of emission sources that contribute to this impact.

Table 3.2-48. Average Daily Operational Emissions - Alternative 3

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	85	110	1,058	41	20	19
Ships - Precautionary Area Transit (1)	29	37	324	14	7	6
Ships - Harbor Transit (1)	33	32	284	11	6	6
Ships - Docking (1)	13	11	102	4	2	2
Ships - Hoteling Aux. Sources	38	114	1,033	89	21	20
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	21	103	600	1	12	11
On-road Trucks	380	1,638	5,658	8	43	40
Trains	13	33	180	4	5	5
Railyard Equipment	0	2	7	0	0	0
Commuting	2	78	6	0	0	0
Project Year 2010 Total	**616**	**2,171**	**9,317**	**172**	**120**	**112**
Net Change from CEQA Baseline	**(105)**	**(857)**	**(3,577)**	**(2,693)**	**(556)**	**(515)**
Project Year 2015						
Ships - Fairway Transit (1)	106	138	1,338	46	25	24
Ships - Precautionary Area Transit (1)	36	46	406	13	8	7
Ships - Harbor Transit (1)	41	40	354	8	8	7
Ships - Docking (1)	16	14	128	3	3	3
Ships - Hoteling Aux. Sources	10	63	296	25	6	5
Tugboats - Cargo Vessel Assist (1)	2	16	33	0	1	1
Terminal Equipment	10	179	176	1	2	2
On-road Trucks	186	762	2,435	9	35	33
Trains	108	298	1,506	1	39	36
Railyard Equipment	2	29	27	0	0	0
Commuting	1	63	4	0	0	0
Project Year 2015Total	**518**	**1,649**	**6,702**	**106**	**128**	**118**
Net Change from CEQA Baseline	**(203)**	**(1,379)**	**(6,192)**	**(2,760)**	**(549)**	**(508)**
Project Year 2020						
Ships - Fairway Transit (1)	127	165	1,591	54	30	28
Ships - Precautionary Area Transit (1)	42	55	483	15	10	9
Ships - Harbor Transit (1)	52	50	435	9	10	9
Ships - Docking (1)	20	17	153	3	3	3
Ships - Hoteling Aux. Sources	12	75	350	30	7	6
Tugboats - Cargo Vessel Assist (1)	2	19	34	0	1	1
Terminal Equipment	6	146	104	1	1	1
On-road Trucks	233	956	2,642	10	49	45
Trains	129	385	1,820	1	47	43
Railyard Equipment	0	17	2	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**625**	**1,930**	**7,616**	**124**	**158**	**147**
Net Change from CEQA Baseline	**(96)**	**(1,098)**	**(5,278)**	**(2,741)**	**(518)**	**(480)**
Project Year 2030						
Ships - Fairway Transit (1)	155	202	1,974	68	37	35
Ships - Precautionary Area Transit (1)	52	68	597	19	12	11
Ships - Harbor Transit (1)	62	60	523	12	11	11
Ships - Docking (1)	24	21	186	4	4	4
Ships - Hoteling Aux. Sources	15	97	438	38	8	8
Tugboats - Cargo Vessel Assist (1)	3	25	45	0	1	1
Terminal Equipment	8	173	135	1	2	2
On-road Trucks	201	825	2,110	12	58	53
Trains	111	376	1,584	1	29	27
Railyard Equipment	0	16	2	0	0	0
Commuting	1	35	2	0	1	1
Project Year 2030 Total	**633**	**1,898**	**7,595**	**156**	**163**	**151**
Net Change from CEQA Baseline	**(88)**	**(1,130)**	**(5,299)**	**(2,709)**	**(513)**	**(475)**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.
(1) Includes auxiliary generator emissions.

Table 3.2-49. Peak Daily Operational Emissions - Alternative 3

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	111	146	1,450	57	28	26
Ships - Precautionary Area Transit (1)	41	53	445	19	9	9
Ships - Harbor Transit (1)	38	40	342	14	8	7
Ships - Docking (1)	18	15	133	5	3	3
Ships - Hoteling Aux. Sources	74	218	1,995	170	41	39
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	81	397	2,308	4	47	43
On-road Trucks	567	2,442	8,439	13	65	60
Trains	39	100	538	12	15	15
Railyard Equipment	1	4	19	0	0	0
Commuting	2	78	6	0	0	0
Project Year 2010 Total	**974**	**3,515**	**15,786**	**292**	**220**	**205**
Net Change from 2005 CEQA Baseline	**(252)**	**(1,431)**	**(6,086)**	**(2,794)**	**(855)**	**(804)**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	81	46	43
Ships - Precautionary Area Transit (1)	65	84	737	23	15	14
Ships - Harbor Transit (1)	64	68	616	15	13	12
Ships - Docking (1)	30	26	237	5	5	5
Ships - Hoteling Aux. Sources	17	99	489	39	9	9
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	32	573	563	3	6	5
On-road Trucks	278	1,136	3,633	13	53	49
Trains	108	299	1,510	1	40	40
Railyard Equipment	2	30	27	0	0	0
Commuting	1	63	4	0	0	0
Project Year 2015 Total	**798**	**2,657**	**10,281**	**180**	**188**	**178**
Net Change from 2005 CEQA Baseline	**(427)**	**(2,289)**	**(11,591)**	**(2,906)**	**(886)**	**(831)**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	18	100	506	40	10	9
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	19	429	305	2	4	4
On-road Trucks	347	1,427	3,941	15	73	68
Trains	133	398	1,882	1	48	48
Railyard Equipment	0	20	3	0	0	0
Commuting	1	44	3	0	0	0
Project Year 2020 Total	**729**	**2,694**	**9,046**	**134**	**184**	**174**
Net Change from 2005 CEQA Baseline	**(497)**	**(2,252)**	**(12,825)**	**(2,952)**	**(891)**	**(835)**
Project Year 2030						
Ships - Fairway Transit (1)	111	146	1,450	51	27	25
Ships - Precautionary Area Transit (1)	41	53	445	14	9	8
Ships - Harbor Transit (1)	38	40	342	8	7	7
Ships - Docking (1)	18	15	133	3	3	3
Ships - Hoteling Aux. Sources	27	149	750	59	14	13
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	34	698	546	4	7	6
On-road Trucks	299	1,230	3,147	18	86	79
Trains	118	398	1,676	1	31	31
Railyard Equipment	0	20	2	0	0	0
Commuting	1	35	2	0	1	1
Project Year 2030 Total	**689**	**2,806**	**8,532**	**158**	**186**	**174**
Net Change from 2005 CEQA Baseline	**(536)**	**(2,139)**	**(13,340)**	**(2,927)**	**(889)**	**(834)**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-50. Maximum Ambient Pollutant Impacts – Unmitigated Operations from the Landside Improvements Alternative

Pollutant	Averaging Time	Maximum Impact from Alternative 3 Emissions ($\mu g/m^3$)	Background Pollutant Concentration ($\mu g/m^3$)	Total Maximum Alternative 3 Impact ($\mu g/m^3$) [a]	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [b]	1-hour	264	226	**490**	338
	Annual	6	53	**59**	56
CO	1-hour	212	4,667	4,879	23,000
	8-hour	78	3,778	3,856	10,000
		Maximum Impact from Alternative 3 Emissions ($\mu g/m^3$)	**Maximum Impact from CEQA Baseline Emissions ($\mu g/m^3$)**	**Maximum CEQA Increment ($\mu g/m^3$) [a.c]**	**SCAQMD Threshold ($\mu g/m^3$)**
PM_{10}	24-hour	1.18	1.16	0.02	2.5
$PM_{2.5}$	24-hour	1.13	1.11	0.02	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Alternative 3 emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Alternative 3 emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NO_x to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impacts are closer than 500 m from this location.

c. Equal to Alternative 3 impact minus CEQA Baseline impact.

Table 3.2-51. Maximum Health Impacts Estimated for Construction and Operations from the Landside Improvements Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Alternative 3	CEQA Baseline	CEQA Increment[2]	Alternative 3	NEPA Baseline	NEPA Increment [2]	
Cancer Risk	Residential	2×10^{-6}	7×10^{-6}	-5×10^{-6}	-	-	-	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	-	-	-	
	Sensitive	1×10^{-6}	4×10^{-6}	-3×10^{-6}	-	-	-	
Chronic Hazard Index	Residential	0.002	0.005	-0.003	-	-	-	1.0
	Occupational	0.003	0.006	-0.003	-	-	-	
	Sensitive	0.002	0.008	-0.006	-	-	-	
Acute Hazard Index	Residential	0.366	0.434	-0.007	-	-	-	1.0
	Occupational	0.080	0.082	-0.002	-	-	-	
	Sensitive	0.086	0.096	-0.010	-	-	-	

Notes:

1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact.
2. The CEQA Increment represents Alternative 3 impact minus CEQA Baseline impact.
3. The significance thresholds for cancer risk and chronic hazard index only apply to the CEQA and NEPA increment values.

Table 3.2-52. GHG Emissions Produced from Construction of the Alternative 3

Construction Phase/Stage	Total Emissions (Metric Tons)			
	CO_2	CH_4	N_2O	CO_2e
Phase 1 / Stage 1	5,581.2	0.895	0.064	5,619
Phase 1 / Stage 2	151.3	0.025	0.002	152
Phase 1 / Stage 3	3,351.2	0.537	0.038	3,374
Phase 1 / Stage 4	5,346.0	0.856	0.061	5,383
Phase 1 / Stage 5	4,066.7	0.651	0.046	4,095
Phase 2 / Stage 1	2,507.8	0.401	0.029	2,525
Phase 2 / Stage 4	302.5	0.05	0.00	305
Total Emissions	**36,730**	**5.9**	**0.4**	**36,983**

Notes:

One metric ton equals 1000 kilograms, 2205 lbs, or 1.1 U.S. (short) tons.

CO_2e = the carbon dioxide equivalent emissions of all GHG combined. The carbon dioxide equivalent emission rate for each GHG represents the emission rate multiplied by its GWP. The GWPs are 1 for CO_2; 21 for CH_4; and 310 for N_2O.

Table 3.2-53. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 3

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2010							
Ships - Fairway Transit (1)	21,513	2.97	0.21	-	-	-	21,641
Ships - Precautionary Area Transit (1)	1,853	0.25	0.02	-	-	-	1,863
Ships - Harbor Transit (1)	1,515	0.21	0.01	-	-	-	1,524
Ships - Docking (1)	508	0.07	0.00	-	-	-	511
Ships - Hoteling Aux. Sources	12,428	1.66	0.08	-	-	-	12,488
Ships Sub Total	37,817	5.16	0.33	-	-	-	38,027
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	14,276	2.06	0.15	-	-	-	14,364
On-road Trucks	141,430	26.35	13.17	-	-	-	146,067
Trains	4,857	0.68	0.05	-	-	-	4,886
Railyard Equipment	219	0.03	0.00	-	-	-	220
Commuting	2,035	0.37	0.36	-	-	-	2,155
Cold-Iron	1,715	0.014	0.008	-	-	-	1,717
Reefers	-	-	-	0.07	0.17	0.08	790
Terminal Electrical Consumption	15,733	0.13	0.07	-	-	-	15,758
Project Year 2010 Total	**218,623**	**35**	**14**	**0.07**	**0.17**	**0.08**	**224,529**
Net Change from 2005 CEQA Baseline	**34,778**	**(2)**	**(2)**	**0.02**	**0.04**	**0.02**	**34,158**
Project Year 2015							
Ships - Fairway Transit (1)	27,315	3.77	0.27	-	-	-	27,477
Ships - Precautionary Area Transit (1)	2,346	0.32	0.02	-	-	-	2,360
Ships - Harbor Transit (1)	1,907	0.26	0.02	-	-	-	1,918
Ships - Docking (1)	638	0.09	0.01	-	-	-	642
Ships - Hoteling Aux. Sources	7,331	0.95	0.02	-	-	-	7,357
Ships Sub Total	39,537	5.38	0.33	-	-	-	39,753
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	15,508	2.24	0.16	-	-	-	15,604
On-road Trucks	149,498	27.81	13.91	-	-	-	154,393
Trains	43,473	6.09	0.43	-	-	-	43,734
Railyard Equipment	2,786	0.40	0.03	-	-	-	2,803
Commuting	2,353	0.43	0.42	-	-	-	2,491
Cold-Iron	3,669	0.031	0.017	-	-	-	3,675
Reefers	-	-	-	0.10	0.23	0.10	1,061
Terminal Electrical Consumption	23,582	0.20	0.11	-	-	-	23,620
Project Year 2015 Total	**281,083**	**43**	**15**	**0.10**	**0.23**	**0.10**	**287,815**
Net Change from 2005 CEQA Baseline	**97,238**	**6**	**(1)**	**0.04**	**0.10**	**0.04**	**97,443**

Note:
1. Includes auxiliary generator emissions.

Table 3.2-53. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 3 (continued)

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Project Year 2020							
Ships - Fairway Transit (1)	32,405	4.47	0.32	-	-	-	32,598
Ships - Precautionary Area Transit (1)	2,789	0.38	0.02	-	-	-	2,805
Ships - Harbor Transit (1)	2,273	0.31	0.02	-	-	-	2,286
Ships - Docking (1)	761	0.10	0.01	-	-	-	766
Ships - Hoteling Aux. Sources	8,709	1.12	0.02	-	-	-	8,740
Ships Sub Total	46,938	6.39	0.39	-	-	-	47,194
Tugboats - Cargo Vessel Assist (1)	812	0.11	0.01	-	-	-	817
Terminal Equipment	20,764	3.00	0.21	-	-	-	20,893
On-road Trucks	168,108	30.87	15.44	-	-	-	173,542
Trains	56,212	7.87	0.55	-	-	-	56,549
Railyard Equipment	3,618	0.52	0.04	-	-	-	3,641
Commuting	2,710	0.50	0.48	-	-	-	2,869
Cold-Ironing + RMG Electrification	7,786	0.065	0.036	-	-	-	7,798
Reefers	-	-	-	0.11	0.27	0.12	1,234
Terminal Electrical Consumption	28,977	0.24	0.13	-	-	-	29,023
Project Year 2020 Total	**329,664**	**48**	**17**	**0.11**	**0.27**	**0.12**	**337,234**
Net Change from 2005 CEQA Baseline	**145,819**	**11**	**1**	**0.06**	**0.13**	**0.06**	**146,862**
Project Year 2030							
Ships - Fairway Transit (1)	40,380	5.57	0.40	-	-	-	40,621
Ships - Precautionary Area Transit (1)	3,467	0.47	0.03	-	-	-	3,487
Ships - Harbor Transit (1)	2,761	0.38	0.02	-	-	-	2,777
Ships - Docking (1)	921	0.13	0.01	-	-	-	927
Ships - Hoteling Aux. Sources	11,243	1.45	0.03	-	-	-	11,282
Ships Sub Total	58,773	7.99	0.49	-	-	-	59,093
Tugboats - Cargo Vessel Assist (1)	1,082	0.15	0.01	-	-	-	1,089
Terminal Equipment	26,215	3.78	0.27	-	-	-	26,378
On-road Trucks	209,056	38.03	19.01	-	-	-	215,748
Trains	54,938	7.69	0.54	-	-	-	55,268
Railyard Equipment	4,018	0.58	0.04	-	-	-	4,042
Commuting	3,595	0.66	0.64	-	-	-	3,806
Cold-Ironing + RMG Electrification	9,545	0.079	0.044	-	-	-	9,561
Reefers	-	-	-	0.13	0.31	0.14	1,426
Terminal Electrical Consumption	31,467	0.26	0.14	-	-	-	31,517
Project Year 2030 Total	**390,604**	**57**	**21**	**0.13**	**0.31**	**0.14**	**399,758**
Net Change from 2005 CEQA Baseline	**206,759**	**20**	**4**	**0.07**	**0.17**	**0.08**	**209,386**

Note:
1. Includes auxiliary generator emissions.

Table 3.2-54. Daily Operational Emissions - POLB - Unmitigated Alternative 4

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	78	120	1,073	333	67	63
Ships - Precautionary Area Transit (1)	27	40	328	110	22	20
Ships - Harbor Transit (1)	30	34	283	87	21	20
Ships - Docking (1)	12	12	103	29	8	7
Ships - Hoteling Aux. Sources	49	143	1,438	893	96	90
Tugboats - Cargo Vessel Assist (1)	2	13	65	0	2	2
Terminal Equipment	21	139	578	1	18	16
On-road Trucks	386	1,671	7,507	7	54	50
Trains	15	39	212	5	6	5
Railyard Equipment	1	10	36	0	1	1
Commuting	2	72	5	0	0	0
Project Year 2010 Total	**624**	**2,293**	**11,628**	**1,465**	**294**	**274**
Net Change from 2005 CEQA Baseline	**(105)**	**(747)**	**(1,288)**	**(1,400)**	**(385)**	**(355)**
Project Year 2015						
Ships - Fairway Transit (1)	91	117	1,129	21	19	18
Ships - Precautionary Area Transit (1)	30	39	344	7	6	6
Ships - Harbor Transit (1)	38	36	315	6	6	6
Ships - Docking (1)	14	12	110	2	2	2
Ships - Hoteling Aux. Sources	30	97	822	37	15	14
Tugboats - Cargo Vessel Assist (1)	2	13	26	0	1	1
Terminal Equipment	8	147	143	1	1	1
On-road Trucks	174	791	2,472	8	38	35
Trains	61	169	853	1	22	21
Railyard Equipment	2	29	27	0	0	0
Commuting	1	57	4	0	0	0
Project Year 2015Total	**450**	**1,508**	**6,245**	**83**	**113**	**105**
Net Change from 2005 CEQA Baseline	**(279)**	**(1,533)**	**(6,671)**	**(2,782)**	**(566)**	**(524)**
Project Year 2020						
Ships - Fairway Transit (1)	112	144	1,386	26	24	22
Ships - Precautionary Area Transit (1)	37	48	422	9	8	7
Ships - Harbor Transit (1)	47	44	390	7	8	7
Ships - Docking (1)	17	15	136	2	3	3
Ships - Hoteling Aux. Sources	17	77	477	30	9	8
Tugboats - Cargo Vessel Assist (1)	2	16	28	0	1	1
Terminal Equipment	11	192	184	1	1	1
On-road Trucks	258	1,056	3,032	10	53	48
Trains	73	218	1,032	1	27	24
Railyard Equipment	2	41	36	0	0	0
Commuting	1	47	3	0	0	0
Project Year 2020 Total	**577**	**1,900**	**7,126**	**87**	**133**	**123**
Net Change from 2005 CEQA Baseline	**(152)**	**(1,141)**	**(5,791)**	**(2,779)**	**(546)**	**(506)**
Project Year 2030						
Ships - Fairway Transit (1)	129	167	1,613	30	28	26
Ships - Precautionary Area Transit (1)	43	56	490	10	9	8
Ships - Harbor Transit (1)	55	51	449	8	9	9
Ships - Docking (1)	20	18	157	3	3	3
Ships - Hoteling Aux. Sources	20	90	546	35	10	10
Tugboats - Cargo Vessel Assist (1)	2	19	34	0	1	1
Terminal Equipment	13	223	220	1	2	2
On-road Trucks	220	900	2,416	12	61	56
Trains	63	214	902	1	16	15
Railyard Equipment	2	39	37	0	0	0
Commuting	0	32	2	0	1	1
Project Year 2030 Total	**569**	**1,810**	**6,865**	**101**	**141**	**131**
Net Change from 2005 CEQA Baseline	**(160)**	**(1,230)**	**(6,051)**	**(2,764)**	**(538)**	**(498)**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (2) Equal to annual emissions divided by 365 days.

(1) Includes auxiliary generator emissions.

Table 3.2-55. Peak Daily Operational Emissions - Unmitigated Alternative 4

	Pounds Per Day (2)					
Project Scenario/Source Type	*ROG*	*CO*	*NOx*	*SOx*	*PM10*	*PM2.5*
Project Year 2010						
Ships - Fairway Transit (1)	105	162	1,496	468	92	86
Ships - Precautionary Area Transit (1)	39	58	459	155	30	28
Ships - Harbor Transit (1)	36	43	352	114	26	24
Ships - Docking (1)	17	17	137	38	10	10
Ships - Hoteling Aux. Sources	117	324	3,431	2,014	228	214
Tugboats - Cargo Vessel Assist (1)	3	22	113	0	4	4
Terminal Equipment	138	856	3,724	4	114	105
On-road Trucks	574	2,474	11,040	11	79	73
Trains	39	100	538	12	15	15
Railyard Equipment	1	8	27	0	1	1
Commuting	2	72	5	0	0	0
Project Year 2010 Total	**1,070**	**4,136**	**21,321**	**2,815**	**599**	**559**
Net Change from 2005 CEQA Baseline	**(156)**	**(810)**	**(550)**	**(271)**	**(476)**	**(450)**
Project Year 2015						
Ships - Fairway Transit (1)	199	256	2,418	45	42	39
Ships - Precautionary Area Transit (1)	65	84	737	15	13	13
Ships - Harbor Transit (1)	64	68	616	12	12	11
Ships - Docking (1)	30	26	237	4	5	5
Ships - Hoteling Aux. Sources	62	193	1,681	73	31	29
Tugboats - Cargo Vessel Assist (1)	3	22	46	0	1	1
Terminal Equipment	39	673	705	4	7	6
On-road Trucks	249	1,149	3,479	12	57	53
Trains	72	199	1,007	1	26	26
Railyard Equipment	2	35	32	0	0	0
Commuting	1	57	4	0	0	0
Project Year 2015 Total	**786**	**2,763**	**10,962**	**167**	**195**	**184**
Net Change from 2005 CEQA Baseline	**(439)**	**(2,183)**	**(10,910)**	**(2,919)**	**(879)**	**(825)**
Project Year 2020						
Ships - Fairway Transit (1)	111	146	1,450	27	24	23
Ships - Precautionary Area Transit (1)	41	53	445	9	8	8
Ships - Harbor Transit (1)	38	40	342	7	7	6
Ships - Docking (1)	18	15	133	2	3	3
Ships - Hoteling Aux. Sources	30	125	820	49	15	14
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	45	763	761	4	4	4
On-road Trucks	373	1,539	4,270	14	78	72
Trains	100	299	1,411	1	36	36
Railyard Equipment	3	63	56	0	0	0
Commuting	1	47	3	0	0	0
Project Year 2020 Total	**762**	**3,111**	**9,729**	**114**	**178**	**168**
Net Change from 2005 CEQA Baseline	**(463)**	**(1,835)**	**(12,142)**	**(2,971)**	**(897)**	**(841)**
Project Year 2030						
Ships - Fairway Transit (1)	111	146	1,450	27	24	23
Ships - Precautionary Area Transit (1)	41	53	445	9	8	8
Ships - Harbor Transit (1)	38	40	342	7	7	6
Ships - Docking (1)	18	15	133	2	3	3
Ships - Hoteling Aux. Sources	30	125	820	49	15	14
Tugboats - Cargo Vessel Assist (1)	3	22	39	0	1	1
Terminal Equipment	68	1,073	1,133	6	12	11
On-road Trucks	313	1,295	3,296	18	91	84
Trains	88	299	1,257	1	23	23
Railyard Equipment	4	68	64	0	1	1
Commuting	0	32	2	0	1	1
Project Year 2030 Total	**714**	**3,167**	**8,980**	**120**	**186**	**174**
Net Change from 2005 CEQA Baseline	**(511)**	**(1,779)**	**(12,892)**	**(2,966)**	**(889)**	**(835)**
SCAQMD Daily Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**

Note: (1) Includes auxiliary generator emissions.

Note: (2) Equal to peak daily emissions, except annual average emissions for the CEQA Baseline.

Table 3.2-56. Maximum Ambient Pollutant Impacts – Unmitigated Operations from the No Project Alternative

Pollutant	Averaging Time	Maximum Impact from Alternative 4 Emissions ($\mu g/m^3$)	Background Pollutant Concentration ($\mu g/m^3$)	Total Maximum Alternative 4 Impact ($\mu g/m^3$) [a,c]	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [b]	1-hour	290	226	**516**	338
	Annual	9	53	**62**	56
CO	1-hour	229	4,667	4,896	23,000
	8-hour	73	3,778	3,851	10,000
		Maximum Impact from Alternative 4 Emissions ($\mu g/m^3$)	**Maximum Impact from CEQA Baseline Emissions ($\mu g/m^3$)**	**Maximum CEQA Increment ($\mu g/m^3$) [a,c]**	**SCAQMD Threshold ($\mu g/m^3$)**
PM_{10}	24-hour	3.55	3.45	0.11	2.5
$PM_{2.5}$	24-hour	3.45	3.34	0.11	2.5

Notes:

a. Exceedance of a threshold is indicated in bold. The thresholds for PM_{10}/$PM_{2.5}$ are incremental and impacts from Alternative 4 emissions minus baseline emissions are compared to the thresholds. The thresholds for NO_2 and CO are combined thresholds and therefore impacts from Alternative 4 emissions plus background pollutant concentrations are compared to the thresholds.

b. NO_2 concentrations based on source to maximum impact location distances of either 500 or 1000 m. The NOx to NO_2 conversion rates for these distances are 25.8 and 46.7 percent (SCAQMD 2003c). This is a conservative approach, as the majority of emission sources that contribute to the maximum NO_2 impacts are closer than 500 m from this location.

c. Equal to Alternative 4 impact minus CEQA Baseline impact.

Table 3.2-57. Maximum Health Impacts Estimated for Operations from the No Project Alternative

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts[1]						Significance Threshold[3]
		Alternative 4	CEQA Baseline	CEQA Increment[2]	Alternative 4	NEPA Baseline	NEPA Increment[2]	
Cancer Risk	Residential	1×10^{-6}	7×10^{-6}	-6×10^{-6}	--	--	--	10×10^{-6}
	Occupational	1×10^{-6}	3×10^{-6}	-2×10^{-6}	--	--	--	
	Sensitive	1×10^{-6}	3×10^{-6}	-2×10^{-6}	--	--	--	
Chronic Hazard Index	Residential	0.006	0.008	-0.002	--	--	--	1.0
	Occupational	0.003	0.006	-0.003	--	--	--	
	Sensitive	0.004	0.008	-0.004	--	--	--	
Acute Hazard Index	Residential	0.101	0.099	0.002	--	--	--	1.0
	Occupational	0.612	0.515	0.097	--	--	--	
	Sensitive	0.084	0.086	-0.002	--	--	--	

Notes:

1. For each receptor type, all risk values correspond to the receptor with the maximum CEQA/NEPA incremental impact.
2. The CEQA Increment represents Alternative 4 impact minus CEQA Baseline impact. The NEPA Increment represents Alternative 4 impact minus NEPA Baseline impact.
3. The significance thresholds for cancer risk and chronic and acute hazard indices only apply to the CEQA and NEPA increment values.

Table 3.2-58. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 4							
Project Scenario/Source Type	**Metric Tons Per Year**						
	CO_2	**CH_4**	**N_2O**	**HFC-125**	**HFC-134a**	**HFC-143a**	**CO_2e**
Project Year 2010							
Ships - Fairway Transit (1)	61,781	8.19	0.55	-	-	-	62,123
Ships - Precautionary Area Transit (1)	1,869	0.25	0.02	-	-	-	1,879
Ships - Harbor Transit (1)	1,494	0.20	0.01	-	-	-	1,502
Ships - Docking (1)	500	0.07	0.00	-	-	-	503
Ships - Hoteling Aux. Sources	15,429	2.07	0.11	-	-	-	15,507
Ships Sub Total	81,073	10.78	0.69	-	-	-	81,514
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	10,629	1.53	0.11	-	-	-	10,695
On-road Trucks	131,858	21.96	10.98	-	-	-	135,723
Trains	5,733	0.80	0.06	-	-	-	5,767
Railyard Equipment	650	0.09	0.01	-	-	-	654
Commuting	1,698	0.31	0.30	-	-	-	1,797
Cold-Iron	5,646	0.047	0.026	-	-	-	5,655
Reefers	-	-	-	0.07	0.16	0.07	747
Terminal Electrical Consumption	14,886	0.12	0.07	-	-	-	14,910
Project Year 2010 Total	**252,713**	**36**	**12**	**0.07**	**0.16**	**0.07**	**258,007**
Net Change from 2005 CEQA Baseline	**68,869**	**(1)**	**(4)**	**0.01**	**0.03**	**0.01**	**67,635**
Project Year 2015							
Ships - Fairway Transit (1)	66,768	8.85	0.60	-	-	-	67,138
Ships - Precautionary Area Transit (1)	2,033	0.27	0.02	-	-	-	2,044
Ships - Harbor Transit (1)	1,654	0.22	0.01	-	-	-	1,663
Ships - Docking (1)	554	0.08	0.00	-	-	-	557
Ships - Hoteling Aux. Sources	10,683	1.42	0.06	-	-	-	10,733
Ships Sub Total	81,692	10.84	0.70	-	-	-	82,135
Tugboats - Cargo Vessel Assist (1)	541	0.07	0.01	-	-	-	544
Terminal Equipment	12,899	1.86	0.13	-	-	-	12,978
On-road Trucks	141,031	23.19	11.59	-	-	-	145,111
Trains	24,643	3.45	0.24	-	-	-	24,790
Railyard Equipment	2,792	0.40	0.03	-	-	-	2,810
Commuting	2,088	0.38	0.37	-	-	-	2,211
Cold-Iron	3,136	0.026	0.014	-	-	-	3,141
Reefers	-	-	-	0.08	0.20	0.09	907
Terminal Electrical Consumption	20,150	0.17	0.09	-	-	-	20,182
Project Year 2015 Total	**288,970**	**40**	**13**	**0.08**	**0.20**	**0.09**	**294,809**
Net Change from 2005 CEQA Baseline	**105,126**	**4**	**(3)**	**0.03**	**0.06**	**0.03**	**104,437**

Note:

1. Includes auxiliary generator emissions.

Table 3.2-58. Annual GHG Emissions due to Operations Within California - Unmitigated Alternative 4 (continued)

Project Scenario/Source Type	Metric Tons Per Year						
	CO_2	CH_4	N_2O	HFC-125	HFC-134a	HFC-143a	CO_2e
Ships - Fairway Transit (1)	82,227	10.90	0.73	-	-	-	82,683
Ships - Precautionary Area Transit (1)	2,495	0.33	0.02	-	-	-	2,508
Ships - Harbor Transit (1)	2,027	0.28	0.02	-	-	-	2,038
Ships - Docking (1)	679	0.09	0.01	-	-	-	683
Ships - Hoteling Aux. Sources	8,801	1.15	0.03	-	-	-	8,836
Ships Sub Total	96,229	12.75	0.81	-	-	-	96,749
Tugboats - Cargo Vessel Assist (1)	677	0.09	0.01	-	-	-	681
Terminal Equipment	15,748	2.27	0.16	-	-	-	15,846
On-road Trucks	177,380	27.92	13.96	-	-	-	182,294
Trains	31,888	4.47	0.31	-	-	-	32,079
Railyard Equipment	3,613	0.52	0.04	-	-	-	3,636
Commuting	2,519	0.46	0.45	-	-	-	2,667
Cold-Iron	6,110	0.051	0.028	-	-	-	6,120
Reefers	-	-	-	0.10	0.24	0.11	1,107
Terminal Electrical Consumption	25,989	0.22	0.12	-	-	-	26,031
Project Year 2020 Total	**360,153**	**49**	**16**	**0.10**	**0.24**	**0.11**	**367,208**
Net Change from 2005 CEQA Baseline	**176,309**	**12**	**(1)**	**0.04**	**0.11**	**0.05**	**176,837**
Project Year 2030							
Ships - Fairway Transit (1)	95,786	12.70	0.85	-	-	-	96,318
Ships - Precautionary Area Transit (1)	2,904	0.39	0.02	-	-	-	2,920
Ships - Harbor Transit (1)	2,339	0.32	0.02	-	-	-	2,352
Ships - Docking (1)	783	0.11	0.01	-	-	-	787
Ships - Hoteling Aux. Sources	10,226	1.33	0.04	-	-	-	10,266
Ships Sub Total	112,039	14.84	0.95	-	-	-	112,643
Tugboats - Cargo Vessel Assist (1)	812	0.11	0.01	-	-	-	817
Terminal Equipment	18,127	2.62	0.19	-	-	-	18,240
On-road Trucks	225,957	33.02	16.51	-	-	-	231,768
Trains	31,291	4.38	0.31	-	-	-	31,479
Railyard Equipment	3,546	0.51	0.04	-	-	-	3,567
Commuting	2,834	0.52	0.50	-	-	-	3,001
Cold-Iron	6,918	0.058	0.032	-	-	-	6,929
Reefers	-	-	-	0.12	0.28	0.12	1,274
Terminal Electrical Consumption	28,115	0.23	0.13	-	-	-	28,160
Project Year 2030 Total	**429,639**	**56**	**19**	**0.12**	**0.28**	**0.12**	**437,878**
Net Change from 2005 CEQA Baseline	**245,794**	**20**	**2**	**0.06**	**0.14**	**0.06**	**247,506**

Note:
1. Includes auxiliary generator emissions.

Table 3.2-59. Mitigation Monitoring Program

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-1: Additional Fugitive Dust Controls. The Project construction contractor shall develop and implement dust control methods that shall achieve this control level in a SCAQMD Rule 403 dust control plan; and designate personnel to monitor the dust control program and order increased watering, as necessary, to ensure a 90 percent control level. Their duties shall include holiday and weekend periods when work may not be in progress. Additional control measures to reduce fugitive dust shall include, but are not limited to, the following: • Apply approved non-toxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas or replace groundcover in disturbed areas; • Provide temporary wind fencing around sites being graded or cleared; • Cover truck loads that haul dirt, sand, or gravel or maintain at least two feet of freeboard in accordance with Section 23114 of the California Vehicle Code; • Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off tires of vehicles and any equipment leaving the construction site; • Suspend all soil disturbance activities when winds exceed 25 mph as instantaneous gusts or when visible dust plumes emanate from the site and stabilize all disturbed areas; • Appoint a construction relations officer to act as a community liaison concerning on-site construction activity including resolution of issues related to PM_{10} generation; • Sweep all streets at least once a day using SCAQMD Rule 1186, 1186.1 certified street sweepers or roadway washing trucks if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water); • Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces; • Pave road and road shoulders; and • Apply water three times daily or as needed to areas where soil is disturbed.	POLB/USACE/ Construction Specifications and Bid Process	During construction/Daily
AQ-2: Emission Controls for Non-road Construction Equipment. Construction equipment shall meet the EPA Tier 4 non-road engine standards, where feasible. The Tier 4 standards become available starting in year 2012.	POLB/USACE/ Construction Specifications and Bid Process /	During construction/ Periodically
AQ-2a: Best Management Practices (BMPs) for Construction Equipment. The construction contractor shall implement the following BMPs on construction equipment, where feasible, to further reduce emissions from these sources. • Use of diesel oxidation catalysts and/or catalyzed diesel particulate traps, as feasible. • Maintain equipment according to manufacturer specifications. • Restrict idling of equipment and trucks to a maximum of five minutes (per ARB regulation). • Use of high-pressure fuel injectors on diesel-powered equipment. • Use of electricity from power poles rather than temporary diesel- or gasoline-powered generators.	POLB/USACE/ Construction Specifications and Bid Process	During construction/ Daily

Table 3.2-59. Mitigation Monitoring Program (continued)

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-2b: Construction Traffic Emission Reductions. The construction contractor shall implement the following measures to further reduce emissions from construction. • Trucks used for construction (a) prior to 2015 shall use engines certified to no less than 2007 NOx emissions standards and (b) in 2015 and beyond shall meet EPA 2010 emission standards. • Provide temporary traffic control such as flag person, during all phases of construction to maintain smooth traffic flow. • Schedule construction activities that affect traffic flow on arterial systems to off-peak hour where possible. • Re-route construction trucks away from congested streets or sensitive receptor areas. • Provide dedicated turn lanes for movement of construction trucks and equipment on- and off-site. • Configure construction parking to minimize traffic interference. • Improve traffic flow by signal synchronization. • All vehicle and equipment will be properly tuned and maintained according to manufacturer specification. • Reduce traffic speeds on all unpaved roads to 15 mph or less.	POLB/USACE/ Construction Specifications and Bid Process	During construction/Periodically for truck emission standards and daily for traffic measures
AQ-3: Emission Controls for Construction Tug Boats. All tug boats used in construction shall meet the EPA Tier 2 marine engine standards, and if feasible use construction tugs that meet the EPA Tier 3 marine engine standards. The Tier 3 standards become available starting in year 2009.	POLB/USACE/ Construction Specifications and Bid Process	During construction/Periodically
AQ-3a: Construction Tugboat Home Fleeting. The construction contractor shall require all construction tug boats that home fleet in the SPBP to (a) shut down their main engines and (b) refrain from using auxiliary engines at dock or to use electrical shore power, if need be.	POLB/USACE/ Construction Specifications and Bid Process	During construction/Daily
AQ-4: Expanded VSRP. All OGVs that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from 40 nm from Point Fermin to the Precautionary Area.	POLB/ Lease agreement and periodic reviews	At the start of operations/ Daily
AQ-5: Shore-to-Ship Power ("Cold Ironing"). All OGV that call at the Middle Harbor container terminal shall utilize shore-to-ship power while at berth according to the following schedule: (1) 33 percent of all OGV by December 2009 (2) 66 percent of all OGV by March 2012, and (3) 100 percent of all OGV by December 2014. Lease stipulations shall include consideration of alternative technologies that achieve 90 percent of the emission reductions of cold-ironing.	POLB/ Lease agreement and periodic reviews	According to operational schedule in measure/ Daily
AQ-6: Low-sulfur Fuels in OGV. All OGV that call at the Middle Harbor container terminal shall use 0.2 percent or lower sulfur MGO fuel in vessel auxiliary and main engines at berth and out to a distance of 40 nm from Point Fermin, or implement equivalent emission reductions.	POLB/ Lease agreement and periodic reviews	At the start of operations/ Daily
AQ-7: Container Handling Equipment. All Project CHE shall meet the following performance standards; • By the end of 2010, all yard tractors shall meet, at a minimum, the EPA non-road Tier 4 engine standards; • By the end of 2012, all pre-2007 on-road or pre-Tier 4 non-road top picks, forklifts, reach stackers, RTGs, and straddle carriers less than 750 Hp shall meet, at a minimum, the EPA non-road Tier 4 engine standards; and • By the end of 2014, all CHE with engines greater than 750 Hp shall meet, at a minimum, the EPA Tier 4 non-road engine standards. Starting in 2009 (until equipment is replaced with Tier 4), all CHE with engines greater than 750 Hp shall install the cleanest available VDEC, as established by the ARB.	POLB/ Lease agreement and periodic reviews.	According to operational schedule in measure/ Daily
AQ-7a: High Efficiency Rail Mounted Gantry (RMG) Cranes. The Project terminal operator shall replace all diesel-powered RTGs with electric-powered RMGs, as soon as feasible, but no later than the completion of construction in 2020. Each RMG shall include high efficiency, regenerative drive systems.	POLB/ Lease agreement and periodic reviews	During operations and no later than 2020/Daily

Table 3.2-59. Mitigation Monitoring Program (continued)

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-8: Heavy-Duty Trucks. Container trucks that call at the Middle Harbor container terminal shall comply with the following replacement schedule as part of the POLB CTP tariff. This measure goes beyond the ARB's requirements for reducing truck emissions. It is similar to CAAP measure HDV1 (CTP). However, it is more stringent and would result in the following: • Ban pre-1989 trucks by 10/1/2008; • Ban 1989-1993 trucks by 1/1/2010; • Ban un-retrofitted 1994-2003 trucks by 1/1/2010; and • Ban all trucks that do not meet the EPA 2007 Heavy-Duty Highway Rule emission standards by 1/1/2012.	POLB/ Port Tariff	According to schedule in measure/ Daily
AQ-9: Clean Railyard Standards. The expanded Pier F intermodal railyard shall incorporate the cleanest locomotive technologies into its operations.	POLB/ Lease agreement and periodic reviews	During operations/ Periodically
AQ-10: Truck Idling Reduction Measures. The Middle Harbor container terminal operator shall minimize on-terminal truck idling and emissions. Potential methods to reduce idling include, but are not limited to (1) maximize the durations when the main gates are left open, including during off-peak hours, and (2) implement a container tracking and appointment-based truck delivery and pick-up system to minimize fuel consumption and resulting criteria pollutant emissions.	POLB/ Lease agreement and periodic reviews	During operations/Daily
AQ-11: Slide Valves on OGV Main Engines. All OGV that call at the Project container terminal shall have slide fuel valves installed on their main engines, or implement an equivalent emission reduction technology. This retrofit is most applicable to OGV with MAN B&W engines.	POLB/ Lease agreement and periodic reviews	During operations/ Periodically
AQ-12: Expanded VSRP for GHG. All OGV that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from the California overwater border to the Precautionary Area.	POLB/ Lease agreement and periodic reviews	At the start of operations/ Daily
AQ-13: Low-sulfur Fuels in OGV for GHG. All OGV that call at the Project container terminal shall use 0.2 percent or lower sulfur MGO fuel in vessel auxiliary and main engines at berth and within California State Waters, or implement equivalent emission reductions.	POLB/ Lease agreement and periodic reviews	At the start of operations/Daily
AQ-14: LEED. The main terminal building shall obtain the LEED gold certification level.	POLB/Construction Specifications and Bid Process	By completion of construction
AQ-15: Compact Fluorescent Light Bulbs. All interior terminal building lighting shall use compact fluorescent light bulbs.	POLB/ Lease agreement and periodic reviews	At the start of operations/ Daily
AQ-16: Energy Audit. The Middle Harbor container terminal tenant shall conduct a third party energy audit every five years and install innovative power saving technologies where feasible, such as power factor correction systems and lighting power regulators.	POLB/ Lease agreement and periodic reviews	During operation/ Every 5 years
AQ-17: Solar Panels. The applicant shall install solar panels on the main terminal building.	POLB/Construction Specifications and Bid Process	By completion of construction

Table 3.2-59. Mitigation Monitoring Program (continued)

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-17a: Solar Carports. The applicant will install carport-mounted PV solar panels over the employee and visitor parking areas to the maximum extent feasible.	POLB/Construction Specifications and Bid Process	By completion of construction
AQ-18: Recycling. The terminal buildings shall achieve a minimum of 40 percent recycling by 2012 and 60 percent recycling by 2015. Recycled materials shall include: • White and colored paper; • Post-it notes; • Magazines; • Newspaper; • File folders; • All envelopes including those with plastic windows; • All cardboard boxes and cartons; • All metal and aluminum cans; • Glass bottles and jars; and • All plastic bottles.	POLB / Construction Specifications and Bid Process	At the start of operations/Daily
AQ-19: Tree Planting. The Port shall plant shade trees around the main terminal building.	POLB/Construction Specifications and Bid Process/GHG Guidelines	By completion of construction
AQ-19a: Tree Planting – Transportation Corridors. The Port shall plant new shade trees on Port-controlled lands adjacent to the roads into the Middle Harbor container terminal to the extent practicable given safety and other land use considerations.	POLB/ Construction Specifications and Bid Process/GHG Guidelines	By completion of construction
AQ-20: Cool Roofs. Buildings on the Middle Harbor container terminal will incorporate cool roofing systems to the extent feasible. Building rooftop areas which are covered with solar panels in accordance with Mitigation Measure AQ-17 shall be exempt from this measure.	POLB/Construction Specifications and Bid Process/GHG Guidelines	By completion of construction
AQ-21: Energy Efficient Boom Flood Lights: The Port shall install boom flood lights with energy efficient features on existing and new dock cranes to the extent feasible. Such features may include, but are not limited to, use of photo cells/timers, low energy fixtures, and light-spillover reduction features, electronic ballasts, use of double filaments, and applying auto-switch-off controls when the crane boom is up.	POLB/Construction Specifications and Bid Process/GHG Guidelines	At the start of operations/Daily

Table 3.2-59. Mitigation Monitoring Program (continued)

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-22: Reefer Lighting. The terminal tenant shall downsize light fittings and associated electrical power usage at reefer platforms to the extent feasible.	POLB/ Lease agreement and periodic reviews	At the start of operations/Daily
AQ-23: Employee Carpooling. The construction contractor and terminal tenant shall encourage construction and terminal employees to carpool or to use public transportation. These employers shall provide incentives to promote the measure, include preferential parking for carpoolers, vanpool subsidies, and they shall provide information to employees regarding the benefits of alternative transportation methods.	POLB/Lease agreement and periodic reviews	During construction and operation/Daily
AQ-24: Mitigation for Indirect GHG Emissions. The terminal tenant shall be required to use green commodities, such as those available from the California Climate Action Registry's Climate Action Reserve, to offset carbon emissions associated with terminal's electricity consumption subject to the limitation specified below. This measure applies to all electricity consumed at the terminal, including shore-to-ship power usage ("cold ironing"). The terminal-related carbon emissions from electricity consumption will be calculated each year based on the local utility's carbon intensity for that year as recognized by the State of California. The tenant may adjust the carbon intensity value to wholly reflect any carbon offsets provided by the electricity deliverer (i.e., point of generation or point of importation) under applicable California and/or federal cap-and-trade regulations (i.e., no double offsetting). The Port is limiting the potential cost of this measure. The maximum expenditure for purchased offsets required under this measure shall not exceed 15 percent of the terminal electricity costs for any given year (i.e., cost of offsets shall not exceed 15% of terminal electricity costs (US$ basis)).	POLB/ Lease agreement and periodic reviews	During operations/ Annually
AQ-25: Periodic Technology Review. To promote new emission control technologies, the tenant shall implement in 2015 and every five years following the effective date of the lease agreement, a review of new air quality technological advancements, subject to mutual agreement on operational feasibility, technical feasibility, and cost-effectiveness and financial feasibility, which shall not be unreasonably withheld agreement. If a technology is determined to be feasible in terms of cost, technical and operational feasibility, the tenant shall work with the Port to implement such technology.	POLB/ Lease agreement and periodic reviews	During operations/ Every 5 years
AQ-26: Cargo Throughput Monitoring. Every five years, the Port shall compare actual cargo throughput that occurred at the terminal to the cargo assumptions used to develop the Final EIS/EIR. The years used in this analysis shall include 2015, 2020, 2025, and 2030. The Port shall calculate annual air emissions associated with these throughput levels (for OGV, assist tugs, locomotives, cargo handling equipment, and trucks) and compare them to the annual air emissions presented in the Final EIS/EIR. If actual emissions exceed those presented in the Final EIS/EIR, then new/additional mitigations would be applied through **Mitigation Measure AQ-25**.	POLB/ Lease agreement and periodic reviews	During operations/ Every 5 years
AQ-27: Electrical Regenerative Systems on Dock Cranes. Port will require that the terminal operator to have electric regenerative systems on all Project dock cranes in Project year 1.	POLB/ Lease agreement and periodic reviews	By completion of construction

Table 3.2-59. Mitigation Monitoring Program (continued)

Mitigation Measure	Responsible Enforcement Party/Mechanism	Frequency/ Implementation Schedule
AQ-28: Greenhouse Gas Emission Reduction Program Guidelines (GHG Program). To partially address the cumulative GHG impacts of the Middle Harbor Redevelopment Project, the Port will require this Project to provide funding for the GHG Program in the amount of $5 million. This money will be used to pay for measures pursuant to the GHG Emission Reduction Program Guidelines, include, but are not limited to, generation of green power from renewable energy sources, ship electrification, goods movement efficiency measures, cool roofs to reduce building cooling loads and the urban heat island effect, building upgrades for operational efficiency, tree planting for biological sequestration of CO_2, energy-saving lighting, and purchase of renewable energy certificates (RECs). The timing of the payments pursuant to this mitigation measure shall be made by the later of the following two dates: (1) the date that the Port issues a Notice to Proceed or otherwise authorizes the commencement of construction on the Phase 1 Construction Contract; or (2) the date that the Middle Harbor Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication.	POLB/ GHG Guidelines	During operations/ Periodically
AQ-29: Cumulative Air Quality Impact Reduction Program. To help reduce cumulative air quality impacts of the Middle Harbor Redevelopment Project, the Port will require the Project to provide funding in support of the Schools and Related Sites Guidelines for the Port of Long Beach Grant Programs and Healthcare and Seniors Facility Program Guidelines for the Port of Long Beach Grant Programs in the amount of $5 million each. The distribution of these funds to potential applicants and projects will be determined through a public evaluation process and by approval of the Board of Harbor Commissioners. The timing of the payments pursuant to this mitigation measure shall be made by the later of the following two dates: (1) the date that the Port issues a Notice to Proceed or otherwise authorizes the commencement of construction on the Phase 1 Construction Contract; or (2) the date that the Middle Harbor Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication	POLB/Air Quality/Noise Guidelines	During operations/ Periodically

Table 3.2-60. Mitigated Alternative 1 Operational Emissions Comparison Between Draft EIS/EIR and Final EIS/EIR

		Is the Impact Significant in FEIS/EIR? (Y/N)						Was There a Change in Significance from DEIR/FEIR?						Change in Emissions (FEIS/EIR - DEIS/EIR) lbs/day						Comments
DEIR / FEIR Tables #'s		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	
Tables 18/20 Annual Average Daily Operational Emissions Associated with the Mitigatied 345-Acre Project Alternative																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	315	3801	3418	-438	51	46	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	N	N	Y	N	N	N	N	N	N	N	N	N	-32	-260	-599	17	-2	-2	The NOx emissions decreased by 599 ppd in FEIR; but are still above the significance threshhold.
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	184	3096	976	-578	23	20	Insignificant for all pollutants. All increments are negative (i.e., reductions); the change in NOx emissions is from a "large" negative number to a "smaller" negative number.
	NEPA inc.	**N**	N	Y	N	N	N	Y	N	N	N	N	N	-109	-406	-1359	41	-11	-11	VOC went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 1359 ppd from DEIR but are still above significant.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	191	2957	828	-696	11	9	Insignificant for all pollutants. All increments are negative (i.e., reductions). Some emission numbers increase but they are still negative. None are significan
	NEPA inc.	Y	**N**	Y	N	N	N	N	Y	N	N	N	N	-110	-418	-7843	53	-16	-15	CO went from went from significant (DEIR) to insignificant (FEIR). VOC and NOx emissions decreased from DEIR to FEIR.NOx still significant.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	184	2923	708.8	-828	-14.2	-14.55	Insignificant for all pollutants. All increments are all negative (i.e., reductions). Some emission numbers increase but they are still negative. (i.e., none are significant).
	NEPA inc.	Y	**N**	Y	N	N	N	N	Y	N	N	N	N	-109	-379	-1061	159.5	-20.5	-18.91	CO went from went from significant (DEIR) to insignificant (FEIR). VOC and NOx emissions decreased from DEIR to FEIR, but are still significant..
Tables 19/21 Peak Daily Operational Emissions Associated with the Mitigatied 345-Acre Project Alternative																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-103	2187	-4396	-1114	-356	-343	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); the change in NOx emissions from DEIR is from a "large" negative number to a "smaller" negative number.
	NEPA inc.	Y	**N**	Y	**N**	N	**N**	N	Y	N	Y	N	Y	-310	-1312	-5926	-557	-111	-104.8	CO, SOx, and PM2.5 went from significant (DEIR) to insignificant (FEIR); .VOC and NOx still significant
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-280	1133	-8012	-1211	-406	-390	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); the change in NOx emissions from DEIR is from a "large" negative number to a "smaller" negative number.
	NEPA inc.	Y	**N**	Y	**N**	N	**N**	N	Y	N	Y	N	Y	-356	-1471	-4973	-446	-105	-101.2	CO, SOx, and PM2.5 went from significant (DEIR) to insignificant (FEIR); .VOC and NOx still significant. and increments are lower than those in the DEIR.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-337	803	-8578	-1651	-401	-385	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); the change in NOx emissions from DEIR is from a "large" negative number to a "smaller" negative number.
	NEPA inc.	Y	Y	Y	**N**	N	Y	N	Y	N	Y	N	Y	-245	-1431	-3124	-691	-57	-56.4	Insignificant for all pollutants. CO, SOx, and PM2.5 went from significant (DEIR) to insignificant (FEIR); .VOC and NOx still significant. But all increments are lower than those in the DEIR.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-343	581	-8947	-1695	-438	-421	All emission numbers are negative (i.e., reductions); the change in NOx emissions from DEIR is from a "large" negative number to a "smaller" negative number.
	NEPA inc.	Y	Y	Y	**N**	N	Y	N	Y	N	Y	N	Y	-196	-1725	-2699	-491	-71	-70.05	CO, SOx, and PM2.5 went from significant (DEIR) to insignificant (FEIR); .VOC and NOx still significant. But all increments are lower than those in the DEIR.

Bold indicates that either the impact is significant in the FEIS/FEIR (identified by a Bold Y) or that there was a change in the impact from Significant in the DEIS/EIR to insignificant in the FEIS/EIR (identified by a Bold N).	**Bold indicates that there was a change in the impact from the DEIS/DEIR to FEIS/FEIR (identified by a Bold Y).**

CEQA Inc. = CEQA Increment ; NEPA Inc. = NEPA Increment

Table 3.2-61. Alternative 1 NEPA and CEQA GHG Baseline Emissions Comparison Between DEIS/DEIR and FEIS/FEIR

Year	Emissions (Metric Tons Per Year)		Percent Change from Draft (%)
	Final EIS/EIR	Draft EIS/EIR	
NEPA Baseline			
2010	224,529	529,498	57.6%
2015	287,815	656,132	56.1%
2020	343,560	754,218	54.4%
2030	407,928	872,056	53.2%
CEQA Baseline			
2005	190,371	208,107	8.5%

Note:
FEIR Results in Lower GHG Emission for NEPA (for all years) and for CEQA Baselines

Table 3.2-62. Alternative 1 GHG Annual Emissions Comparison Between DEIS/DEIR and FEIS/FEIR

Year		Emissions (Metric Tons Per Year)		Percent Change from Draft (%)
		Final EIS/EIR	Draft EIS/EIR	
2010	**Alternative 1 Totals**	232,169	546,669	57.5%
	CEQA inc.	41,797	338,561	87.7%
	NEPA inc.	7,640	17,170	55.5%
2015	**Alternative 1 Totals**	285,528	605,642	52.9%
	CEQA inc.	95,157	397,535	76.1%
	NEPA inc.	-2,287	-50,490	95.5%
2020	**Alternative 1 Totals**	371,236	783,621	52.6%
	CEQA inc.	180,865	575,514	68.6%
	NEPA inc.	32,850	29,404	-11.7%
2030	**Alternative 1 Totals**	437,429	920,858	52.5%
	CEQA inc.	247,058	712,751	65.3%
	NEPA inc.	36,360	48,802	25.5%

Note:
FEIR Results in Lower GHG Emissions than DEIR for All Years

Table 3.2-63. Alternative 1 Health Impacts Comparison Between DEIS/DEIR and FEIS/FEIR

Health Impact	Receptor Type	Maximum Predicted Incremental Impacts			
		CEQA		NEPA	
		Final EIS/EIR	Draft EIS/EIR	Final EIS/EIR	Draft EIS/EIR
Cancer Risk	Residential	-6×10^{-6}	-5×10^{-6}	8×10^{-6}	5×10^{-6}
	Occupational	-2×10^{-6}	-12×10^{-6}	9×10^{-6}	**11×10^{-6}**
	Sensitive	-2×10^{-6}	-7×10^{-6}	4×10^{-6}	5×10^{-6}

Note:
All health impacts in DEIR and FEIR are insignificant (No change).
Max. Occupational cancer risk dropped from > 10 in a million to < 10 million
However, significance is only assessed based on residential receptors (no change in significance).
Acute and chronic health impacts were insignificant in DEIR and no changes in FEIR, they were not remodeled.

Table 3.2-64. Mitigated Alternative 2 Operational Emissions Comparison Between Draft EIS/EIR and Final EIS/EIR

		Is the Impact Significant in FEIS/EIR? (Y/N)						Was There a Change in Significance from DEIR/FEIR?						Change in Emissions (FEIS/EIR - DEIS/EIR) lbs/day						Comments
DEIR / FEIR Tables #'s		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	
Tables 34/36 Average Daily Operational Emissions - Mitigated Alternative 2																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	317	3780	3328	-437	52	48	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	N	N	**N**	N	N	N	N	N	Y	N	N	N	-37	-293	-711	19	-3	-3	Insignificant for all pollutants. NOx changed from Significant (DEIR) to insignificant (FEIR). Except for SOX, all increments dropped from the DEIR (NOx by 711 ppd).
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	192	3110	1002	-577	25	23	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	**N**	N	Y	N	N	N	Y	N	N	N	N	N	-108	-405	-1356	41	-12	-10	Insignificant for all pollutants, except for NOx. VOC went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 1356 from DEIR but are still significant.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	191	3004	909	-570	23	21	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	**N**	N	**N**	N	N	N	Y	N	Y	N	N	N	-118	-385	-1186	179	-6	-5	Insignificant for all pollutants. VOC and NOx went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 1156 from DEIR.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	187	2490	742	-806	-10	-10	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	**N**	N	Y	N	N	N	Y	N	N	N	N	N	-114	-824	-1050	181	-19	-17	Insignificant for all pollutants, except for NOx. VOC went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 1356 from DEIR but are still significant.
Tables 35/37 Peak Daily Operational Emissions - Mitigated Alternative 2																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-112	2734	-4564	-1111	-357	-344	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in CO increment from DEIR is from "large" negative number to a "smaller" negative number.
	NEPA inc.	**N**	**N**	Y	**N**	N	**N**	Y	Y	N	Y	N	Y	-319	-766	-6094	-555	-113	-106	Insignificant for all pollutants, except for NOx. VOC,CO, and PM2.5 went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 6094 ppd from DEIR but are still significant.
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-280	1134	-8008	-1210	-406	-390	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); all increments dropped from the DEIR (NOx by 8008 ppd).
	NEPA inc.	**N**	**N**	Y	**N**	N	**N**	Y	Y	N	Y	N	Y	-356	-1470	-4967	-445	-105	-101	Insignificant for all pollutants, except for NOx. VOC,CO, and PM2.5 went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 6094 ppd from DEIR but are still significant.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-326	867	-8402	-1201	-390	-374	Insignificant for all pollutants. Except for CO, all emission numbers are negative (i.e., reductions), Except for CO, all increments dropped from the DEIR (NOx by 8402 ppd).
	NEPA inc.	**N**	**N**	Y	**N**	N	**N**	Y	Y	N	Y	N	Y	-235	-1367	-2949	-241	-46	-46	Insignificant for all pollutants, except for NOx. VOC,CO, and PM2.5 went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 2949 ppd from DEIR but are still significant.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-374	-111	-8976	-1656	-421	-405	Insignificant for all pollutants. Except for CO, all emission numbers are negative (i.e., reductions), All increments dropped from the DEIR (NOx by 8976 ppd).
	NEPA inc.	**N**	**N**	Y	**N**	N	**N**	Y	Y	N	Y	N	Y	-227	-2415	-2728	-450	-54	-54	Insignificant for all pollutants, except for NOx. VOC,CO, and PM2.5 went from significant (DEIR) to insignificant (FEIR). NOx emissions decrease by 2728 ppd from DEIR but are still significant.

Bold indicates that either the impact is significant in the FEIS/FEIR (identified by a Bold Y) or that there was a change in the impact from Significant in the DEIS/EIR to insignificant in the FEIS/EIR (identified by a Bold N).	**Bold indicates that there was a change in the impact from the DEIS/DEIR to FEIS/FEIR (identified by a Bold Y).**

CEQA Inc. = CEQA Increment ; NEPA Inc. = NEPA Increment

Table 3.2-65. Alternative 3 Operational Emissions Comparison Between Draft EIS/EIR and Final EIS/EIR

DEIR / FEIR Tables #'s		Is the Impact Significant in FEIS/EIR? (Y/N)						Was There a Change in Significance from DEIR/FEIR?						Change in Emissions (FEIS/EIR - DEIS/EIR) lbs/day						Comments
		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	
Tables 46/48 Average Daily Operational Emissions - Alternative 3																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	354	4073	4039	-456	55	50	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	300	3514	2358	-619	37	34	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	310	3389	2095	-749	29	26	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	301	3314	1792	-987	9	8	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); Change in NOx increment from DEIR is from "large" negative number to a "smaller" negative number.
Tables 47/49 Peak Daily Operational Emissions - Alternative 3																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-57	2553	-3506	-1100	-352	-340	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); CO has a significant increase while all other numbers show decreases; NOx decreases significantly
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-119	1674	-5988	-1175	-386	-372	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); CO has a significant increase while all other numbers show decreases; NOx decreases significantly
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-166	1411	-6653	-1171	-366	-353	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); CO has a significant increase while all other numbers show decreases; NOx decreases significantly
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-212	1112	-7415	-1607	-384	-370	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); CO has a significant increase while all other numbers show decreases; NOx decreases significantly

Bold indicates that either the impact is significant in the FEIS/FEIR (identified by a Bold Y) or that there was a change in the impact from Significant in the DEIS/EIR to insignificant in the FEIS/EIR (identified by a Bold N).	**Bold indicates that there was a change in the impact from the DEIS/DEIR to FEIS/FEIR (identified by a Bold Y).**

CEQA Inc. = CEQA Increment ; NEPA Inc. = NEPA Increment

Table 3.2-66. Unmitigated Alternative 4 Operational Emissions Comparison Between Draft EIS/EIR and Final EIS/EIR

		Is the Impact Significant in FEIS/EIR? (Y/N)						Was There a Change in Significance from DEIR/FEIR?						Change in Emissions (FEIS/EIR - DEIS/EIR) lbs/day						Comments
DEIR / FEIR Tables #'s		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	
Tables 52/54 Average Daily Operational Emissions - Unmitigated Alternative 4																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-105	-747	-1288	-1400	-385	-355	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-279	-1533	-6671	-2782	-566	-524	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-152	-1141	-5791	-2779	-549	-506	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-160	-1230	-6051	-2764	-538	-498	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
Tables 53/55 Peak Daily Operational Emissions - Unmitigated Alternative 4																				
2010	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-156	-810	-550	-271	-476	-450	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2015	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-439	-2183	-10910	-2919	-879	-825	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2020	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-463	-1835	-12142	-2971	-897	-841	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.
2030	CEQA inc.	N	N	N	N	N	N	N	N	N	N	N	N	-511	-1779	-12892	-2966	-889	-835	Insignificant for all pollutants. All emission numbers are negative (i.e., reductions); All numbers show decreases; NOx decreases are large.

Bold indicates that either the impact is significant in the FEIS/FEIR (identified by a Bold Y) or that there was a change in the impact from Significant in the DEIS/EIR to insignificant in the FEIS/EIR (identified by a Bold N).	**Bold indicates that there was a change in the impact from the DEIS/DEIR to FEIS/FEIR (identified by a Bold Y).**

CEQA Inc. = CEQA Increment ; NEPA Inc. = NEPA Increment

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3.3 HYDROLOGY AND WATER QUALITY

3.3.1 Environmental Setting

3.3.1.1 Area of Influence

The area of influence for Project effects on hydrology and water quality is defined as the inner and outer harbor waters of Long Beach Harbor. Although it is adjacent to Los Angeles Harbor and the two are connected via Cerritos Channel and the outer harbors, measurable effects of the Middle Harbor Project are not expected to reach waters of Los Angeles Harbor due to distance.

3.3.1.2 Setting

The Project is located in an area of landfills and slips between the inner and outer harbor. Waters in this area are marine with freshwater inflows primarily from storm runoff. Direct precipitation on the water surface also adds freshwater, and small amounts of dry weather runoff enter harbor waters. The existing beneficial uses of coastal and tidal waters in the Inner Harbor areas include industrial service supply, navigation, non-contact water recreation, commercial and sport fishing, preservation of rare and endangered species, and marine habitat (SWRCB 1994). Beneficial uses in the Outer Harbor are navigation, water contact and non-contact recreation, commercial and sport fishing, marine habitat, and preservation of rare and endangered species. Waters in the Project area that are 303(d)-listed for impairment (list approved by EPA June 28, 2007) include the Los Angeles/Long Beach Outer Harbor (inside breakwater), Los Angeles/Long Beach Inner Harbor, and Los Cerritos Channel (SWRCB 2007). Total Maximum Daily Loads (TMDLs) for pollutants are currently being developed for the Los Angeles/Long Beach Harbor. The Port, through the TMDL Stakeholder process, is actively participating in the development of the TMDLs for Long Beach Harbor. TMDLs are scheduled for completion in 2008 for copper and zinc in the Inner Harbor and sediment toxicity in the Outer Harbor. For all other constituents, except beach closures (2004 TMDL), the completion date is 2019. Public beaches that could be affected by beach closures are not present in the Project area. The reasons for impairment are summarized in Table 3.3-1.

Marine Water Quality

Marine water quality in Long Beach Harbor is primarily affected by climate, circulation, biological activity, surface runoff, effluent discharges, and accidental discharges of pollutants related to shipping activities. Suspension of bottom sediments can also affect water quality through release of contaminants and by reducing dissolved oxygen concentrations. Harbor water quality has been extensively studied for many years and has improved considerably since the 1960s as a result of pollution control measures. Within Long Beach Harbor, water quality in the inner and middle areas is poorer than in the outer harbor due to reduced circulation and increased runoff from urban and industrial areas (SAIC 1995). The water quality parameters commonly used to describe marine water quality include salinity, temperature, nutrients, dissolved oxygen, hydrogen ion concentration (pH), transparency/turbidity, and contaminant loading.

Salinity. Salinity in harbor waters varies due to the effects of stormwater runoff, waste discharges, rainfall, and evaporation. Harbor salinities usually range from 30.0 to 34.2 parts per thousand (ppt), but salinities ranging from less than 10.0 ppt to greater than 39.0 ppt have been reported (USACE and LAHD 1984). Measurements in Slip 1 during 2000 showed salinity to range from 24.8 to 33.0 ppt in bottom waters and 33.1 to 33.6 ppt in surface waters (MEC and Associates 2002). In October 2006, salinity in the Project area was approximately 33.3 ppt from surface to bottom (Weston Solutions 2006a).

Temperature. Temperature of waters in the harbor shows seasonal and spatial variations that reflect the influence of the ocean, local climate, physical configuration of the harbor, and circulation patterns. General trends in water temperature

Table 3.3-1. Section 303(d) Listed Waters in Long Beach Harbor

Listed Waters/Reaches	Impairments
Los Angeles/Long Beach Outer Harbor, inside breakwater (4042 acres)	DDT, PCBs, sediment toxicity
Los Angeles/Long Beach Inner Harbor (3003 acres)	Beach closures, benthic community effects, Cu, Zn, DDT, PCBs, sediment toxicity
Los Cerritos Channel (31 acres)	Ammonia, bis(2ethylhexyl)phthalate/DEHP, coliform bacteria, Cu, Pb, Zn, trash Sediment: chlordane

Source: SWRCB 2007.

consist of uniform, cooler temperatures throughout the water column in the winter and spring and warmer but stratified temperatures, with cooler waters at the bottom, in the summer and fall. In 2000, surface water temperatures in Slip 1 averaged 58.6°F in January, 61.9°F in May, 71.8°F in August, and 63.9°F in November. Bottom temperatures were 1.2 to 7.9°F lower with the larger difference occurring in the spring to summer (MEC Analytical Systems, Inc. 2002). In October 2006, temperatures were 60.8 to 58.6°F from surface to bottom (Weston Solutions 2006a).

Nutrients. Nutrients, in addition to availability of light, can limit the photosynthetic production by phytoplankton. Factors that influence nutrient concentrations include biological processes, wastewater discharge, and stormwater runoff. Depending on location, depth, and season, nutrients in the Long Beach/Los Angeles Harbor complex may vary in concentration by several orders of magnitude. The enclosed nature of the harbor creates seasonal and spatial levels of nutrients that vary from the so-called “normal” levels found in areas outside the breakwaters. The following ranges of nutrient concentrations were measured in 1978 by Harbors Environmental Projects (HEP 1980): phosphate, 0.172 to 12.39 parts per million (ppm); ammonia, 0.12 to 119.28 ppm; nitrate, 0.00 to 82.97 ppm; and nitrite, 0.00 to 5.38 ppm. Nutrient concentrations were high during periods of high stormwater runoff. Other sources of nutrients in harbor waters include wastewater discharges such as the Terminal Island Treatment Plant (TITP) in the Outer Harbor and industrial discharges. Point source inputs, such as effluent discharges from wastewater treatment plants, are regulated through discharge permits. Compared to these nutrient concentrations measured in the 1970s, current baseline concentrations may be relatively lower due to greater restrictions on the wastewater discharges to the harbor. However, data from long-term monitoring efforts do not exist to verify this.

Dissolved Oxygen. Dissolved Oxygen (DO) is a principal indicator of marine water quality. The EPA and the RWQCB have established a DO concentration of five milligrams per liter (mg/L) as the minimum concentration for aquatic habitats (EPA 1986; SWRCB 1994). The RWQCB also requires that the mean annual DO concentration be six mg/L or greater with no event less than five mg/L. DO concentrations may vary considerably based on the influence of a number of parameters such as respiration of plants and other organisms, waste (nutrient) discharges, surface water mixing through wave action, diffusion rates at the water surface, and disturbance of anaerobic bottom sediments. Sampling in Middle Harbor waters in 2000 showed DO in surface, mid-depth, and bottom waters to range from 4.2 to 8.6 mg/L with concentrations below five mg/L only near the bottom in May (MEC Analytical Systems, Inc. 2002). In October 2006, DO was above seven mg/L from top to bottom (Weston Solutions 2006a).

pH. pH is the hydrogen ion concentration, which typically ranges from 7.0 to 9.0 in marine waters. It is affected by plant and animal metabolism, mixing with water with different pH values from external sources, and, on a small scale, by disturbances in the water column that cause redistribution of waters with varying pH levels or the resuspension of bottom sediments. In the Outer Harbor, pH levels have ranged from 8.1 (upper level in warmer months) to 7.4 (lower levels, cooler months). In Long Beach Harbor waters, pH levels have ranged from 7.0 to 8.7. Recent measurements within Middle Harbor found pH to be consistently between 7.7 and 8.2 at all depths throughout the year (MEC Analytical Systems, Inc. 2002). In October 2006, pH was 8.3 to 8.4 in the Project area (Weston Solutions 2006a). The RWQCB has established an acceptable range of 6.5 to 8.5 with a change in tolerance level of no more than 0.2 due to discharges (i.e., Project impacts).

Transparency/Turbidity. Transparency is a measure of the ability of water to transmit light, or water clarity, and it is measured by the distance a black and white disk (i.e., a secchi disk) can be seen through the water and by a transmissometer that measures percent light transmission through water. Turbidity is also a measure of water clarity as affected by the amount of suspended solids in the water column. Increased turbidity usually results in decreased transparency. Turbidity generally increases as a result of one or a combination of the following conditions: fine sediment from terrestrial runoff or resuspension of fine bottom sediments; planktonic bloom; and dredging activities. Historically, water clarity in the harbor has varied tremendously with secchi disk readings ranging from 0.0 to 40 feet. Water clarity has generally increased since 1967, although individual readings still vary greatly. Suspended solids concentrations in surface waters of the Outer Harbor range from less than one to 22.4 mg/L (USACE and LAHD 1992). One cause of increased turbidity is phytoplankton blooms following storm runoff events during warm weather. The storm runoff typically provides high nutrient levels that are efficiently utilized by the phytoplankton. In Slip 1 and near East Basin, transmissivity measured at three depths in 2000 ranged from 16 to 39 percent in bottom waters and from 43 to 69 percent in surface waters (MEC Analytical Systems, Inc. 2002). In October 2006, transmissivity at the surface in the Project area was 52 percent (Weston Solutions 2006a).

Contaminants. Contaminants in the harbor water column can include low levels (relative to water quality standards) of heavy metals (particularly cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), oil and grease, chlorinated hydrocarbons (e.g., pesticides such as DDTs and chlordanes), and polychlorinated biphenyls (PCBs). Analysis of water samples taken at mid depth at two locations in the Project area in October 2006 (Weston Solutions 2006a) showed that most pollutants (Table 3.3-2), including PCBs, pesticides, semivolatile organic compounds, and organotins, were below detection limits. Arsenic, cadmium, chromium, copper, lead, nickel, and zinc were detected, but concentrations were well below water quality standards (California Toxics Rule levels). Concentrations of heavy metals in water samples collected from Slip 3 in October 2006 (Weston Solutions 2006b) ranged below the detection limit for mercury and silver to 3.96 µg/l for zinc, and all concentrations were well below water quality standards. PCBs, organochlorine pesticides, organotins, phenols, and ammonia were not detected, while PAH concentrations ranged from below detection limits to 33.8 mg/l for phenanthrene (which has no water quality objective). Most of these contaminants have a low solubility in water and adsorb onto particulate matter that settles to the bottom. These contaminants have been found in harbor sediments as addressed below. In addition, some contaminated sediment areas have been covered by less contaminated sediments as part of recent landfill construction, thereby sealing them from interchange with the overlying water. Sources of contaminants include municipal and industrial wastewaters and stormwater runoff. Another source is dry and wet aerial fallout. Data from the RWQCB indicate that there are nine major NPDES discharge sources (including one publicly owned

Table 3.3-2. Dissolved Contaminants in Harbor Water near Project

Analyte	Units	Water Quality Standard[1]	East Basin[2]	Back Channel[2]
Oil and Grease	µg/l	--	2.2	1.9
Arsenic	µg/l	36	1.25	1.1
Cadmium	µg/l	9.3	0.017	0.015
Chromium (VI)	µg/l	50	0.31	0.27
Copper	µg/l	3.1	0.46	0.48
Lead	µg/l	8.1	0.01[3]	0.01[3]
Mercury	µg/l	--	<0.01	<0.01
Nickel	µg/l	8.2	0.204	0.192
Selenium	µg/l	71	<0.01	<0.01
Silver	µg/l	--	<0.02	<0.02
Zinc	µg/l	81	0.88	1.076
PCBs (Aroclors)	µg/l	0.03	<0.5	<0.5
4,4'-DDT	µg/l	0.001	<0.050	<0.050
Chlordane	µg/l	0.004	<0.50	<0.50
Dieldrin	µg/l	0.0019	<0.050	<0.050
Endosulfan	µg/l	0.0087	<0.050	<0.050
Endrin	µg/l	0.0023	<0.050	<0.050
Heptachlor	µg/l	0.0036	<0.050	<0.050
Heptachlor Epoxide	µg/l	0.0036	<0.050	<0.050
Toxaphene	µg/l	0.0002	<2.0	<2.0
Dibutyltin	µg/l	--	<3.0	<3.0
Monobutyltin	µg/l	--	<3.0	<3.0
Tetrabutyltin	µg/l	--	<3.0	<3.0
Tributyltin	µg/l	--	<3.0	<3.0
Semivolatile Organic Compounds	µg/l	7.9[4]	<2-25	<2-50

Notes:
1. California Toxics Rule, Criterion Continuous Concentration (CCC) for saltwater.
2. < indicates below method of detection limit indicated.
3. Estimated value.
4. Only pentachlorophenol has a CCC for saltwater.

Source: Weston Solutions 2006a.

treatment works [the TITP]), 48 minor discharges, and 61 discharges covered by general permits (RWQCB 2007) that discharge into San Pedro Bay directly or via Dominguez Channel. Additional stormwater runoff enters the harbors through Dominguez Channel and other miscellaneous sources. Maintenance dredging, previous channel deepening projects, and long-term effluent limitations imposed by the RWQCB are responsible for decreased chemical contamination in harbor waters and sediments.

Recent studies have linked the atmospheric deposition of pollutants such as particulates, mercury**,** and polycyclic aromatic hydrocarbons (PAHs) to pollutant loads in water bodies in the Chesapeake Bay and Great Lakes. In response to such research, California air and water regulators have also begun to examine the role of atmospheric deposition in California waters, both fresh and salt. One potential method to regulate deposition is through the TMDL program (established and regulated as part of the Clean Water Act), which sets daily load allocations on a pollutant by pollutant basis, and by doing so focuses on preventing pollutants at their source from entering the water bodies. TMDLs have been established in California**,** and therefore**,** an existing model could be used to develop a similar program for pollutants deposited via air transport. However, a number of issues related to atmospheric deposition still remain. Deposition mechanisms are not understood for all potential pollutants**,** and research on actual concentrations of such pollutants is still not complete. Additionally, there is controversy in regards to the legal authority of the California Water Boards in regulating sources that are traditionally regulated by the Air Boards. Air pollutants can also travel long distances**,** and identifying true sources can be complicated.

Presentations at a public workshop on February 9, 2006 indicate that the primary sources of pollutants, such as zinc, in aerial deposition are dust from paved and unpaved roads, tire wear, and construction areas (Stolzenbach 2006). Direct aerial deposition of metals onto the water surface is a minor source of pollutants in the water.

The Port, through its CAAP**,** will actively reduce air pollutants in the Port, thereby complying with the goal of reducing potential air deposition at its source for targeted pollutants. The CAAP is focused primarily on PM, NO_x, and SO_x reduction, but also aims to reduce all pollutant sources, thereby reducing total available pollutants. Additionally, the Port will comply with any future regulation to control water pollution.

Freshwater Quality

Surface water (freshwater) in the Middle Harbor area consists primarily of stormwater runoff, which drains into the adjacent harbor waters. Following storm events, the quality of surface water may be degraded due to loading from petroleum hydrocarbons, metals, semi-volatile organic compounds (SVOC), particulate matter associated with the operation of vessel unloading facilities, industrial land uses, and runoff from roadways. POLB storm drains were sampled in 2004-2005 (MBC 2005), once in dry weather and twice in wet weather. These samples showed that particulates (measured as total suspended solids) increased to over 100 mg/L at some of the storm drains while concentrations at others remained low. Total Recoverable Petroleum Hydrocarbon (TRPH) concentrations varied but were below eight mg/L in both wet and dry samples and undetectable in many of the samples. For metals, only copper, lead, nickel, and zinc concentrations in the wet weather samples at many of the stations were above the California Toxics Rule (CTR) continuous concentration criteria for saltwater. In the dry weather samples, only copper exceeded the CTR criterion. The samples at some locations also contained detectable amounts of SVOC, but these concentrations were below the CTR criteria. The saltwater criteria were used for comparison because, although water from these drains is generally freshwater (but can be brackish based on conductivity measurements), it mixes with the marine harbor waters at the discharge point of each drain. After dilution through mixing, concentrations of metals are expected to be less than the CTR criteria.

Sediment Quality

Sediments in the Project vicinity are predominantly fine grained (MEC Analytical Systems, Inc. 2002). In Slip 1, sediments were over 99 percent silt and clay, while the channel just south of East Basin was 89 percent silt and clay. East Basin was last dredged in 1997 with Slip 3 dredged in 1999 and Slip 1 dredged in 1971. Soils in the areas to be excavated for widening Slip 3 were sampled as described in Section 3.1, Geology, Groundwater, and Soils, and some areas of contamination were found for Total Extractable Hydrocarbons (TEHs), Organochlorine Pesticides (OCPs), and PAHs (Pacific Edge Engineering, Inc. 2006). The concentrations of all metals tested were below the California Total Threshold Limit Concentration (TTLC), but the copper concentration at one site exceeded the California Soluble Threshold Limit Concentration (STLC). Additional testing found the soluble concentration to be less than the STLC of five mg/L.

Although no numerical sediment quality objectives exist, sediment quality objectives are being developed by the California State Water Resources Control Board (SWRCB). Therefore, sediment quality typically is characterized by comparing measured bulk sediment results to published sediment quality guidelines (Long et al. 1995) as follows:

- Effect Range Low (ER-L) = concentrations below which minimal toxic effects are expected; and
- Effect Range Medium (ER-M) = concentrations above which toxic effects are expected.

Sediment samples collected four times from August 1994 to January 1996 in Slip 1 and Slip 2 (which was subsequently filled) were analyzed for metals, chlorinated pesticides, PAHs, and total petroleum hydrocarbons (SAIC and MEC 1997). The results (Table 3.3-3) indicate that copper, lead, mercury, nickel, and zinc concentrations were slightly elevated (above ER-L but below ER-M). Elutriate tests in 2001 indicated that chromium concentrations were slightly higher than at a reference site (URS 2004).

Sediments in Slip 3 were sampled in September 2006 (Weston Solutions 2006b), and the chemical test results are summarized in Table 3.3-4. The top layer consisted of 60.6 to 86.1 percent fine grained sediments while the bottom layer consisted of 33.3 to 52.6 percent fine grained material. For metals, arsenic, copper, mercury, and nickel were slightly elevated (above ER-L but below ER-M) in top sediments. Total PCBs, total detectable DDTs, six PAHs, and total low molecular weight (LMW) PAHs also were slightly elevated in top sediments. None of the other contaminants tested in top sediments and no contaminants in the bottom sediments were elevated. Most PCBs, Arochlors, pesticides, and phenols were not detectable. Elutriate test on the sediments found no contaminants to exceed water quality objectives for the protection of marine life (Weston Solutions 2006b).

Dredging projects in both the Inner and Outer Harbor areas have removed contaminated sediments, and the input of contaminants has decreased through discharge controls. In addition, some contaminated sediment areas have been covered by less contaminated sediments as part of recent landfill construction, thereby sealing them from interchange with the overlying water. Nevertheless, some localized areas of contaminated sediments still remain.

Oceanography

Long Beach/Los Angeles Harbor is a southern extension of the relatively flat coastal plain, bounded on the west by the Palos Verdes Hills. The Palos Verdes Hills offers protection to the bay from prevailing westerly winds and ocean currents. The harbor was originally an estuary that received freshwater from the Los Angeles and San Gabriel rivers. Over the past 80 to 100 years, development of the Long Beach/Los Angeles Harbor complex, through dredging, filling, oilfield production, certain industries, and channelization, has completely altered the local estuarine physiography.

Tides. Tides are sea level variations that result from astronomical and meteorological conditions. Tidal variations along the coast of southern California are caused by the passage of two harmonic tide waves, one with a period of 12.5 hours and the other with a period of 25 hours. This

Table 3.3-3. Mean Concentrations of Pollutants in Sediments of Slip 1 and Slip 2

Pollutant	Concentration (ppm)	ER-L	ER-M
Cadmium	0.50	1.2	9.6
Chromium	55.0	81	370
Copper	96.8	34	270
Lead	63.5	47	218
Mercury	0.48	0.15	0.71
Nickel	37.0	20.9	51.6
Silver	0.45	1.0	3.7
Zinc	180	150	410
Benzo(a)pyrene (PAH)	0.54	0.43	1.60
DDE	0.031	0.002	0.027
TRPH	1008	--	--

Source: SAIC and MEC 1997; Kinnetic Laboratories and ToxScan 2002.

Table 3.3-4. Mean Concentration (mg/kg = ppm) of Pollutants in Sediments of Slip 3

Pollutant	Top Layer	Bottom Layer	ER-L	ER-M
Arsenic	10.6	6.07	8.2	70
Cadmium	0.77	0.37	1.2	9.6
Chromium	44.3	25.1	81	370
Copper	63.8	29.3	34	270
Lead	38.1	15.7	46.7	218
Mercury	0.30	0.14	0.15	0.71
Nickel	25.3	18.3	20.9	51.6
Silver	0.15	0.13	1.0	3.7
Zinc	118	69.6	150	410
Total PCBs	47.1	8.3	22.7	180
Total Detectable DDTs	22.9	0.0	1.6	46.1
Acenaphthene	32.2	1*	16	500
Anthracene	124	5.8	85	1100
Benz[a]anthracene	312	13.7	261	1600
Benzo[a]pyrene	485	18.9	430	1600
Chrysene	504	21.4	384	2800
Dibenz[a,h]anthracene	85.2	3.1*	63	260
Total LMW PAHs	2121.7	105.3	552	3160

Notes:
Concentrations are the higher value for composites from samples in the north and south portion of Slip 3.
* = estimated value.
LMW = low molecular weight PAHs.
Source: Weston Solutions 2006b.

combination of two harmonic tide waves usually produces two high and two low tides each day. The twice daily (semidiurnal) tide of 12.5 hours predominates over the daily (diurnal) tide of 25 hours in Long Beach Harbor, generating a diurnal inequality, or mixed semidiurnal tide. This causes a difference in height between successive high and low waters ("water(s)" is commonly used in this context instead of "tide"). The result is two high waters and two low waters each day, consisting of a higher high water (HHW) and a lower high water (LHW), and a higher low water (HLW) and a lower low water (LLW).

A greater-than-average range between HHW and LLW occurs when the moon, sun, and earth are aligned with each other to create a large gravitational effect. This spring tide corresponds to the new and full moons. Neap tides, which occur during the first and third quarters of the moon, have a narrower range between HHW and LLW. In this situation, the moon, sun, and earth are perpendicular to each other, thereby reducing the gravitational effect on water levels.

The mean tidal range for the Outer Harbor, calculated by averaging the difference between all high and low waters, is 3.76 feet; and the mean diurnal range, calculated by averaging the difference between all the HHW and LLW, is approximately 5.6 feet (USACE and LAHD 1992). The extreme tidal range (between maximum high and maximum low waters) is about 10.5 feet. The highest and lowest tides reported are 7.96 feet above MLLW and -2.56 feet below MLLW, respectively (USACE and LAHD 1992). MLLW is the mean of all lower low waters, equal to 2.8 feet below MSL, and is the datum from which southern California tides are measured.

Available harbor tide data from 1923 to 1984 indicate that the highest water elevations usually occur during November through March. This is the same period in which the more severe offshore storms usually occur along the California coast. These higher water elevations typically range from +7.0 to +7.5 feet MLLW.

Waves. Waves impinging on the southern California coast can be divided into three primary categories according to origin: southern hemisphere swell; northern hemisphere swell; and seas generated by local winds. The Long Beach/Los Angeles Harbor complex is directly exposed to ocean swells entering from two main exposure windows to the south and southeast, regardless of swell origin. The more severe waves from extratropical storms (Hawaiian storms) enter from a southerly direction. The Channel Islands and Santa Catalina Island provide some sheltering from these larger waves, depending on the direction of approach. The other major exposure window opens to the south, allowing swells to enter from storms in the southern hemisphere, tropical storms (chubascos), and southerly waves from extratropical storms. Waves and seas entering the harbor are greatly diminished by the time they reach the Inner Harbor.

Most swells from the southern hemisphere arrive at Long Beach/Los Angeles from May through October. Southern hemisphere swells characteristically have low heights and long periods Wave period is a measurement of the time between two consecutive peaks as they pass a stationary location. Typical swells rarely exceed four feet in height in deep water. However, with periods as long as 18 to 21 seconds, they can break at over twice their deep-water wave height. Northern hemisphere swells occur primarily from November through April. Deep water significant wave heights have ranged up to 20 feet, but are typically less than 12 feet. Northern hemisphere wave periods generally range from 12 to 18 seconds. Local wind-generated seas are predominantly from the west and southwest. However, they can occur from all offshore directions throughout the year, as can waves generated by diurnal sea breezes. Local seas are usually less than six feet in height, with wave periods of less than 10 seconds.

Circulation. Tidal currents primarily determine water circulation in the Middle Harbor area of Long Beach Harbor. Winds and storms also have short-term effects on circulation patterns. A weak, net counterclockwise (east to west) circulation pattern exists within Long Beach Harbor. Draft hydrodynamic modeling results from the POLA Channel Deepening Project indicate that circulation is poorer in Slip 1 than in Slip 3 or the East Basin (USACE No Date).

Flooding. Portions of the existing landfills (on Pier D and on Pier F) in the Project area are within the 100-year flood zone (Figure 3.3-1). All of the adjacent harbor waters are also in this flood zone. None of the Project area is within the 500-year flood zone. The only sources of flooding at the Project sites within the 100-year flood zone would be storm surge, tsunami, or seiche. The latter two sources are discussed in Section 3.1, Geology, Groundwater, and Soils. Rainfall events that result in runoff that exceeds the capacity of the storm drains could also cause localized flooding until the runoff drained away. Middle Harbor is predominantly paved, so minimal surface water infiltration would occur during flooding.

3.3.1.3 Regulatory Setting

Clean Water Act. This Act provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. Discharges (including through dredge and fill) of pollutants must be authorized through either individual or general NPDES permits. These permits can include WDRs and SWPPPs. The SWRCB and its regional water quality control boards implement sections of the Act through the Water Quality Control Plan, Standard Urban Stormwater Mitigation Plans, and permits for discharges. Under Section 303(d), the State is required to list water segments that do not meet water quality standards and to develop action plans, called TMDLs, to improve water quality.

Water Quality Control Plan, Los Angeles Region (Basin Plan, Adopted 1994). The SWRCB Basin Plan is designed to preserve and enhance water quality and to protect beneficial uses of regional waters (inland surface waters, groundwater, and coastal waters such as bays and estuaries). The Basin Plan designates beneficial uses of surface water and groundwater, such as contact recreation or municipal drinking water supply. The Basin Plan also establishes water quality objectives, which describe the pollution thresholds beyond which the beneficial uses will be impaired, and describes implementation programs. Beneficial uses and water quality objectives combine to form water quality standards (WQS) under the Clean Water Act.

State Water Resources Control Board, Stormwater Permits. The SWRCB has developed a statewide General Construction Activity Stormwater Permit and a General Industrial Activity Stormwater Permit for projects that do not require an individual permit for these activities. The General Construction Activities Stormwater Permit applies to all stormwater discharges associated with construction activity, except for those on tribal lands, those in the Lake Tahoe Hydrologic Unit, and those performed by Caltrans. Under this permit, all construction activities that disturb one acre or more must:

- Prepare and implement a SWPPP that specifies BMPs to prevent construction pollutants from contacting stormwater. The intent of the SWPPP and BMPs is to keep all products of erosion from moving offsite into receiving waters;
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States; and
- Perform sampling and analytical monitoring to determine the effectiveness of BMPs in: (a) preventing further impairment by sediment in stormwaters discharged directly into waters listed as impaired for sediment or silt; and (b) reducing or preventing pollutants (even if not

visually detectable) in stormwater discharges from causing or contributing to exceedances of water quality objectives.

The General Industrial Activities Stormwater Permit (Water Quality Order 97-03-DWQ) effluent limitations require dischargers to “meet all applicable provisions of Sections 301 and 401” of the CWA “using best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT).” Receiving water limitations require stormwater discharges to “not cause or contribute to a violation of an applicable water quality standard” and “to reduce or prevent pollutants in stormwater discharges.” Dischargers must:

- Prepare and implement a SWPPP to identify sources of pollution and describe and ensure implementation of BMPs to reduce or prevent industrial pollutants in stormwater discharges;
- Eliminate unauthorized non-storm discharges to the storm drain system; and
- Develop and implement a monitoring program to demonstrate compliance with the General Permit, aid in implementation of the SWPPP, and measure effectiveness of BMPs. The monitoring shall conduct visual observations and analytical sampling of stormwater discharges.

State Water Resources Control Board, Standard Urban Stormwater Mitigation Plans. The City of Long Beach is covered under a Permit for Municipal Stormwater and Urban Runoff Discharges (RWQCB Order No. 99-060 and NPDES No. CAS004003). This permit incorporates the Long Beach Stormwater Management Program (LBSWMP) and the Long Beach Monitoring Program (LBMP). The LBSWMP consists of the following elements:

1. Program Management;
2. Geographic Characterization;
3. Public Agency Activities Program;
4. Development Planning/Construction Program;
5. Illicit Connection/Illicit Discharge Elimination Program;
6. Education/Public Information Program; and
7. Annual Reporting Program.

The LBMP consists of:

1. Mass emissions monitoring;
2. Multi-species toxicity testing;
3. Toxicity identification evaluations;
4. BMPs effectiveness evaluations;
5. Co-operative monitoring – Los Angeles River; and
6. Co-operative monitoring – Los Cerritos Channel.

The City of Long Beach must comply with specified receiving water limitations; discharge prohibitions; stormwater management, monitoring, and reporting; and special and standard provisions.

California Porter-Cologne Act. This Act (State Water Code Sections 13000 *et seq.*) is the basic water quality control law for California and works in concert with the federal CWA. The state Act is implemented by the SWRCB and its nine regional boards which implement the permit provisions of Section 402 and certain planning provisions of Sections 205, 208, and 303 of the federal Act. This means that the state issues one discharge permit for purposes of federal and state law. Permits for discharge of pollutants are officially called NPDES permits. Anyone who is discharging waste or proposing to discharge waste that could affect the quality of state waters must file a “report of waste discharge” with the governing RWQCB.

Additional water quality permitting requirements may include an NPDES General Construction Activities Stormwater Permit (including the development of a SWPPP) from the SWRCB for projects that would disturb over one acre and a General Industrial Activities Stormwater Permit that requires dischargers to develop and implement a SWPPP, eliminate unauthorized non-storm discharges, and conduct visual and analytical stormwater discharge monitoring to verify the effectiveness of the SWPPP.

California Toxics Rule of 2000 (40 CFR Part 131). This rule establishes numeric criteria for priority toxic pollutants in inland waters as well as enclosed bays and estuaries to protect ambient aquatic life (23 priority toxics) and human health (57 priority toxics). The toxics rule also includes provisions for compliance schedules to be issued for new or revised NPDES permit limits when certain conditions are met. The numeric criteria are the same as those recommended by the Environmental Protection Agency in its CWA Section 304(a) guidance.

Figure 3.3-1. 100-Year and 500-Year Flood Zones

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The Los Angeles Regional CSTF Long-Term Management Strategy. The Los Angeles Regional CSTF, comprised of the USACE, EPA, CCC, RWQCB, CDFG, POLB, POLA, City of Long Beach, Los Angeles County Beaches and Harbors, Heal the Bay, and other interested parties, prepared a long-term sediment management strategy (2005) to minimize potential adverse environmental impacts associated with the dredging and disposal of contaminated sediments. The management strategy's long-term goal is to beneficially reuse 100 percent of contaminated sediments, including the disposal of these sediments in sequestered landfills.

The overall goal of the CSTF is “to develop a Long-Term Management Strategy for dredging and disposal of contaminated sediments from coastal waters adjacent to Los Angeles County.” Of the four specific objectives under this goal, the third one is to “promote beneficial reuse,” which would apply to the Project. The Project is consistent with this objective because contaminated sediments dredged from Middle Harbor would be placed in a confined disposal site within the Project fill, and that fill would then be used to expand and increase the efficiency of the proposed container terminal. Because additional fill would be needed, contaminated sediments from other locations in the area would also be placed within the confined disposal site. Proposed beneficial reuse of contaminated sediments would ensure that the Project would meet the goals of the sediment management strategy.

3.3.2 Impacts and Mitigation Measures

3.3.2.1 Significance Criteria

Pursuant to the POLB Environmental Protocol (POLB 2006) and consistent with CEQA Guidelines *Appendix G* Environmental Checklist, impacts to hydrology and water quality are considered significant if the Project would:

WQ-1: Result in violation of regulatory standards or guidelines (e.g., California Water Code, Water Quality Control Plan, Clean Water Act, California Toxics Rule, etc.);

WQ-2: Substantially alter water circulation or currents;

WQ-3: Result in flooding that could harm people, damage property, or adversely affect biological resources; or

WQ-4: Result in wind or water erosion that causes substantial soil runoff or deposition not contained or controlled onsite.

3.3.2.2 Methodology

Potential water and sediment quality impacts of the Project and alternatives were assessed through a combination of literature data (including all applicable water quality criteria), results from past projects in the Port, results from previous testing of sediments, and scientific expertise of the preparers. For oceanographic resources and flooding, potential impacts were assessed using results from previous modeling studies for the harbor, Federal Emergency Management Agency (FEMA) flood zone maps, and preparer expertise. Impacts would be significant if any of the criteria listed above are met as a result of the Project.

The assessment of impacts is based on the assumption that the Project would include the following:

- A Section 404 (Clean Water Act) permit from the USACE for dredging, filling, and wharf construction activities in waters of the harbor;
- A Section 401 (Clean Water Act) Certification from the RWQCB for construction dredging and filling activities that contains conditions including standard WDRs;
- An individual NPDES permit for construction stormwater discharges or coverage under the General Construction Activity Stormwater Permit, which would be obtained for the onshore portions of the Project;
- All onshore contaminated soils would be characterized and remediated in accordance with POLB, RWQCB, DTSC, and LBFD protocol and clean-up standards, as necessary;
- Monitoring to ensure that return water flow from discharge of fill material (i.e., material dredged from the harbor or imported and used to create new landfills) behind the fill dikes meets the RWQCB WDRs for settleable solids and toxic pollutants;

- In compliance with the Los Angeles Regional CSTF Long-Term Management Strategy, dredged contaminated sediments would be placed in approved confined disposal facilities within the harbor that are engineered and constructed in such a manner that the contaminants cannot enter harbor waters after the fill is complete, or at an appropriate upland site;
- The terminal operator would be required by the terms of the lease to participate in the POLB Stormwater Program in order to comply with the General Industrial activities Permit;
- A Municipal Stormwater and Urban Runoff Discharge Plan would be prepared and implemented for the Project;
- Consistent with federal and state permits requirements for fill placement, construction plans would include measures to prevent turbidity from leaving the fill site and entering Middle Harbor and would require monitoring (week before, during, and week after) to verify that turbidity levels just outside the containment dike during and immediately following discharges of fill remain below WQS. If monitoring shows exceedance of WQS, discharge shall stop until measures are implemented to reduce turbidity entering Middle Harbor; and
- Consistent with federal regulatory requirements, the Project would comply with the National Flood Insurance Program (NFIP) floodplain management building requirements.

3.3.2.3 Alternative 1 – 345-Acre Alternative (the Project)

Construction Impacts

Impact WQ-1.1: Wharf demolition, dredging, and excavation in Slip 3 and Berth F201, and fill in Slip 1 and the East Basin could result in violation of regulatory standards or guidelines.

Wharf demolition at Berths D29-D31, E23-E26, E12-E13, and F1-F10; dredging and excavation to deepen and widen Slip 3; reconstruction of wharves at Berths E24-E26; wharf upgrades at Berth E27; placement of fill in Slip 1 and to extend Berth E24 during Phase 1; placement of fill in East Basin during Phase 2; and excavation of Berth F201 would affect the quality of harbor waters in the Middle Harbor through dredging and excavation, filling, rocky dike construction/ reconstruction, pile removal, and pile and sheet pile installation.

In-water construction activities that involve excavation of existing fill, removal of the existing wharves and riprap, pile driving, rock riprap placement, and dredging would cause short-term increases in suspended sediments and turbidity, decreases in dissolved oxygen, increases in nutrients, and increases in dissolved contaminants (e.g., heavy metals and organic chemicals) in areas where contaminated sediments may occur. These effects would generally be confined to the immediate vicinity of the dredging, excavation, pile removal and driving, and rock placement activities (USACE and LAHD 1992) and in the adjacent East Basin.

Dredging would occur in Slip 3 and for keying-in the fill containment dikes for each construction stage, while excavation would occur in Slip 3 and at Berth 201. ("Keying in the dike" refers to creating a shallow ditch at the base of the dike to act as a footing to secure the dike.) Dredging (i.e., removal of bottom sediments) would resuspend silt, clays, and organic material in the bottom sediments, and in-water excavation (i.e., removal of existing fill to create open water) would suspend sediments from the fill being excavated. Dredging and excavation would occur 12 times over a period of 10 years, lasting from 16 to 84 days each time, for a total of 528 days with an average of 44 days. The plume durations are expected to be generally short, with the concentration of suspended solids returning to background levels within one to 24 hours after dredging stops (Parish and Wiener 1987; LAHD observations). Placement of fill material in Slip 1 and the East Basin using bottom-dump barges would increase suspended sediments in the vicinity of the filling and has the potential to release contaminants to the water as the sediment falls through the water column to the bottom. The amount of suspended sediments and turbidity from these activities would be somewhat greater in the immediate vicinity of the filling operations than at the dredge site because the dredge operates with suction while the filling operation is by bottom-dump barge or discharge from a pipe. Turbidity would occur within Slip 1 and in the East Basin throughout the filling process, but would be of short duration once filling is complete (USACE and LAHD 1992). A study of dredge material releases in San Francisco Bay showed a three- to four-minute reduction in DO levels near the point of release (USACE and LAHD 1973).

Water circulation in Slip 1 and the East Basin is limited to tidal movements since no through flow can occur, which would minimize the spread of any released contaminants outside the East Basin. Construction of the containment dikes on the south side of the Slip 1 fill and on the west side of the East Basin fill would also restrict circulation in the fill areas.

Pile removal during wharf demolition where new wharves would be built and pile driving operations associated with wharf construction (about 948 piles for Berths E24-E26 and 493 for Berth E23), as well as driving sheet piles for upgrades at Berth E27 would cause localized and temporary turbidity. Wharf and bulkhead demolition would occur seven times in eight years for a total of 800 days with a range of 65 to 182 days each and an average of 114 days. Pile and bulkhead installation would occur 11 times in nine years for a total of 503 days with a range of eight to 126 days and an average of 46 days. Placement of new riprap for reconstruction of Berths E24-E26 and for fill containment would also cause localized and temporary turbidity. Rock placement would occur nine times in nine years for a total of 695 days with a range of 50 to168 days and an average of 77 days. Sediments would be suspended in the immediate vicinity of these activities, particularly during pile removal. Pollutants in those sediments could be released to the water or settle to the bottom with the sediments. Pile removal would occur prior to dredging, and much of the sediment that settles out from this activity would be removed by the dredging.

DO levels in aquatic habitats can be reduced by the introduction of high concentrations of suspended particulates. This is especially true if the particulates are from anaerobic sediments, which would place an oxygen demand on the surrounding waters. DO levels would be reduced in the immediate vicinity of dredging and pile removal activities by the introduction of high concentrations of suspended particulates and by the oxygen demand on the surrounding waters from anaerobic sediments. The reduction in DO levels, however, would be brief and of limited spatial extent. A study in New York Harbor showed a small reduction in DO near the dredge but no reductions in DO levels 200 to 300 feet away from the dredging activities (Lawler, Matusky, and Skelly 1983). Thus, water quality objectives for DO would not be exceeded outside the mixing zone.

Turbidity would increase during construction activities, accompanied by decreased water clarity, due to the suspension of fine materials during the dredging process and for a short settling period following each operation. The size and duration of the turbidity plume is determined by the time it takes for the suspended materials to settle-out, combined with the current velocity. Settling rates are largely determined by the grain size of the suspended material but are also affected by the chemistry of the particle and the receiving water (USACE and LAHD 1992). Sampling based on water transmissivity at 82, 164, and 328 feet from a pilot dredging project (USACE et al. 2002, Moore and Edmunds 2002) found the turbidity plume for clean sediments did not extend over 328 feet in the down current direction. A typical mixing zone in a permit for dredging is 328 feet (USACE 2002). Based on this information, turbidity from Project dredging would affect a small section of the East Basin near the dredging site and would not substantially affect water quality outside the mixing zone. Thus, water quality objectives for turbidity/light transmittance would not be exceeded outside the mixing zone.

The pH may decrease in the immediate vicinity of dredging locations. This change would be caused by the reducing conditions found in the dredged sediments as the sediments are released into the water column. Seawater, however, is a buffer solution (Sverdrup et al. 1942) that acts to minimize changes in pH. Therefore, any measurable change in pH would likely be highly localized and short in duration. Thus, water quality objectives for pH would not be exceeded outside the mixing zone.

Contaminants, including metals and organics, could be released into the water column during the dredging and pile removal/driving operations. However, like pH and turbidity, any increase in contaminant levels in the water is expected to be localized and of short duration. Previous water quality monitoring efforts associated with both project and maintenance dredging in the harbor have shown that substantial resuspension of contaminated sediments does not occur. A recent dredge management plan pilot study also showed minimal resuspension and dispersal of contaminated sediments during dredging (USACE 2002). In addition, elutriate tests on the sediments to be dredged in Slip 3 showed no elevation of contaminants above water quality objectives for protection of marine life (Weston Solutions 2006b). Furthermore, water quality sampling would be conducted during dredging as required by Project permits. Since resuspension of sediments is expected to be localized and short term, dredging along Berths E24-E27 and D28 would not substantially affect water quality in terms of contaminants.

Suspended sediments containing contaminants would settle to the bottom under the turbidity plume caused by the dredging and pile removal. The amount of contaminants redistributed in this manner would be small, and the distribution localized (primarily within Slip 3 adjacent to the work area). Permit-required monitoring associated with previous dredging projects in the harbor has shown that substantial resuspension of contaminated sediments does not occur. Consequently, concentrations of contaminants in sediments of East Basin adjacent to the dredged area would not be measurably increased by dredging activities because resuspension (followed by settling) of sediments is expected to be low. Filling a portion of East Basin in Phase 2 would cover those sediments in the fill area.

Nutrients could be released into the water column during the dredging, excavation, and filling activities, and operations, and these nutrients could promote nuisance growths of phytoplankton. Observations of previous dredge projects (including the Port of Los Angeles' Deep Draft Navigation Improvement Project [USACE and LAHD 1992]) indicate that phytoplankton blooms have occurred during the spring while dredging was underway. Phytoplankton blooms are normal in the spring in the Southern California Bight as a result of upwelling of bottom nutrients (Gruber and McWilliams 2005, Nezlin and Li 2003). Dredging, excavation, and filling could release nutrients that may contribute to natural phytoplankton blooms, although there is no evidence that this has happened on previous projects. Since the dredging and filling would be similar to that of the previous projects, adverse effects on phytoplankton populations and beneficial uses of the Middle Harbor area are not anticipated to occur in response to this Project.

Leaks or spills from equipment working in or over the water during dredging, filling, and wharf reconstruction/construction would have a very low probability of occurring based on similar work in the past.

<u>CEQA Impact Determination</u>

Dredging, excavation, filling, new wharf construction, and wharf reconstruction and upgrades during the construction phases of the Project would not involve any direct or intentional discharges of wastes to harbor waters. However, in-water work would disturb and resuspend bottom sediments with temporary and localized changes to some water quality parameters such as turbidity, DO, nutrients, pH, and contaminants at in-water work locations. Water quality objectives for these parameters would not be exceeded outside the mixing zone, and these short-term effects would not create pollution, contamination, a nuisance, or violate any water quality standards. All in-water work would be conducted in accordance with Project-specific permits that include measures to minimize impacts to water quality and monitoring to verify the performance of those measures. Leaks or spills of petroleum products from equipment are not expected to occur during Project construction. Any spills that did occur would be small and cleaned up immediately in conformance with existing regulations. Therefore, impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water quality would be less than significant.

<u>NEPA Impact Determination</u>

Impacts from dredging, excavation, filling, new wharf construction, and wharf reconstruction and upgrades during construction of the Project would be the same as described for the CEQA determination. Therefore, less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water would be less than significant.

Impact WQ-1.2: Backland construction activities could result in violation of regulatory standards or guidelines.

Construction activities related to filling the subsided area at the southwest end of Pier E, the railyard improvements, development of facilities on the new landfills, and redevelopment of approximately 294 acres of backlands could result in temporary impacts on marine water quality through surface water runoff containing asphalt leachate, concrete washwater, and other construction materials, particularly during the rainy season. It is assumed that contaminated soils would be remediated prior to construction (Section 3.3.2.2). Erosion and runoff of upland soils into the harbor is discussed under **Impact WQ-4.1**.

Runoff of construction-related contaminants other than soils from onshore construction sites would enter harbor waters primarily through storm drains. Most runoff would occur during storm events, although some could occur during use of water as part of construction activities. Standard BMPs, such as sediment barriers, sedimentation basins, and site contouring, would be used during these construction activities to minimize runoff of contaminants dissolved in water and adsorbed on soil particles in compliance with the State General Permit for Stormwater Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ) and a Project-specific SWPPP. Sediment control measures generally have an average efficiency of approximately 70 percent, although efficiencies can be higher, particularly for coarser materials such as sand (EPA 1993). Thus, a small amount of pollutants associated with soils could reach harbor waters via storm drains, but this runoff would be rapidly diluted by rainfall and mixing in the immediate vicinity of the drain discharge.

Effects of this runoff on DO, pH, and nutrient levels would be minor and limited to the vicinity of the drain discharge locations because control measures would prevent the runoff of materials that could cause water quality standards to be exceeded. The small amount of pollutants that could pass the control measures would not result in a major input. No substances that are identified in the 303(d) list for the Inner Harbor (e.g., DDT and PCBs) would be used during construction, but some could be present in soils to be disturbed during construction activities (Section 3.1, Geology, Groundwater, and Soils). These substances generally have a very low solubility in water and remain adsorbed on sediment particles. Control of soil runoff (**Impact WQ-4.1**) from contaminated areas would be in accordance with all applicable regulations and would prevent these substances from entering harbor waters.

If dewatering activities were required for Project construction, shallow groundwater collected from the dewatering activities may contain unacceptable levels of contaminants, affecting the ability to discharge this water into nearby drainages and harbor waters. Any Project-related dewatering activities would be required to either discharge into the sanitary sewer, under permit with the City of Long Beach Sanitation Bureau, or comply with the NPDES permit regulations and an associated SWPPP regarding discharge into storm drains and/or directly into harbor waters. Such permit requirements typically include onsite treatment to remove pollutants prior to discharge. Alternatively, the water could be temporarily stored onsite in holding tanks, pending offsite disposal at a facility approved by the RWQCB. Incorporation of NPDES-mandated SWPPP elements would ensure that potential pollutants encountered during excavation would be isolated and collected for transportation to a licensed/applicable facility, or treatment prior to their discharge into the storm drain system.

Based on past history for this type of work in the harbor, accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging, excavation, filling, and wharf demolition and construction are unlikely to occur during the Project and thus there is a low potential for adverse affects on water quality from these sources. Most spills of this nature would be small and cleaned up immediately. Accidental leaks and spills during onshore construction activities would also have a very low probability of occurring and entering storm drains due to implementation of BMPs (e.g., containment measures, sediment barriers, and sedimentation basins) in the Project-specific SWPPP. Most spills on land are expected to be small and contained within the work area. Existing regulations, such as the General Construction Activity Stormwater Permit and LBSWMP, include requirements to avoid or minimize effects on water quality during construction activities, and these would be implemented during the Project.

<u>CEQA Impact Determination</u>

Construction of backland improvements and new facilities have the potential to adversely affect harbor water quality in the immediate vicinity of storm drains and other locations where runoff can enter the harbor. These construction activities, however, generally would not create pollution, contamination, a nuisance, or violate any water quality standards due to implementation of BMPs to control runoff of soils and pollutants. Runoff from general construction activities would have short-term, localized impacts on water quality that are less than significant. Examples of BMPs that would be included in the SWPPP are:

- Equipment shall be inspected regularly (daily) during construction, and any leaks found shall be repaired immediately;
- Refueling of vehicles and equipment shall be in a designated, contained area;
- Drip pans shall be used under stationary equipment (e.g., diesel fuel generators), during refueling, and when equipment is maintained;
- Drip pans that are in use shall be covered during rainfall to prevent washout of pollutants; and
- Monitoring to verify that the BMPs are implemented and kept in good working order.

Accidental spills of pollutants would cause less than significant impacts under CEQA in the short term.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water quality would be less than significant.

NEPA Impact Determination

Impacts of backland development on existing land are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. Therefore, no impacts would occur under NEPA due to runoff from backland development and redevelopment, or due to accidental spills of pollutants during onshore construction activities on non–existing lands, because these activities are part of the NEPA Baseline. Development of facilities on the new fills, however, is not part of that baseline, and impacts on water quality would be less than significant.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water quality would be less than significant.

Impact WQ-2: Construction activities would not substantially alter harbor water circulation.

Harbor water movement patterns would remain unchanged by backland construction. With respect to on-land surface water, although grading would result in minor local changes in drainage patterns, topography would be changed very little. Surface water would be directed to flow across paved, impermeable surfaces and through surface drains toward the waters of Middle Harbor or the Inner Harbor. New storm drains would be constructed to handle runoff from the landfills in Slip 1, for the Berth E24 extension, and in East Basin.

Circulation patterns in the Middle to Inner Harbor would change very little as a result of the dredging and filling activities for the Project, although tidal current velocities could be slightly lower due to the increased water depth in Slip 3. Hydrodynamic modeling results showed that the POLA Pier 300 fill options of 40 and 80 acres would have minor effects on water circulation in both the Inner and Outer Harbors (Bunch et al. 1999). The proposed fill in Slip 1 and East Basin would be of similar size, and effects on circulation and water quality in Middle Harbor and the Inner Harbor would be minor.

Tides would remain unchanged in the harbor as a result of the Project because no restrictions to tidal flow would be created. The tidal prism would be slightly reduced by the fill.

Wave action in Middle Harbor would not change substantially as a result of the Project because waves entering East Basin are unlikely to be reflected or enhanced by Project structures.

CEQA Impact Determination

Movement of water in East Basin and the harbor would not be substantially changed by the Project, and impacts would be less than significant under CEQA.

Mitigation Measures

As impacts on hydrology would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology would be less than significant.

NEPA Impact Determination

Movement of water in East Basin and the harbor would not be substantially changed by dredging and filling for the Project, and less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on hydrology would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology would be less than significant.

Impact WQ-3.1: Project construction would not result in increased flooding that would have the potential to harm people or damage property or sensitive biological resources.

Although portions of the Project site are located within the 100-year flood zone, Project construction would not increase the potential for flooding onsite because drainage would be maintained. Site elevations would remain generally the same as a result of Project construction, and runoff would be directed to storm drains.

Project construction would increase the land surface area upon which precipitation would fall by a net gain of 54.6 acres. Drainage slopes and storm drains would be installed during development of the fill surface to adequately handle storm runoff without flooding, even though development of terminal facilities on the fill would increase the impermeable surface present and thus the volume of surface runoff. Redevelopment of the existing backlands would increase the amount of impermeable surfaces where unpaved areas are paved, but this would not increase the potential for flooding because existing storm drains would carry the runoff to the adjacent harbor waters.

<u>CEQA Impact Determination</u>

Because flooding would not be increased by Project construction, flooding impacts would be less than significant under CEQA.

Mitigation Measures

As flood-related impacts would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on flooding would be less than significant.

<u>NEPA Impact Determination</u>

Construction would increase the land surface area upon which precipitation would fall by 54.6 acres. Development of terminal facilities on the fill would also increase the impermeable surface present. These changes would result in comparatively larger runoff volumes, but drainage slopes and storm drains would be installed during development of the fill surface to adequately handle storm runoff without flooding. Less than significant impacts would occur under NEPA.

Mitigation Measures

As flood-related impacts would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on flooding would be less than significant.

Impact WQ-4.1: Construction activities have the potential to accelerate natural processes of wind and water erosion and sedimentation, resulting in substantial soil runoff or deposition which could not be contained or controlled onsite.

Ground disturbances and construction activities related to construction of the Pier F intermodal railyard, filling of 3.3 acres of subsided land, redevelopment of approximately 294 acres of backlands, and temporary storage of surcharge material on the new fills would result in temporary impacts on surface water quality through runoff of soils. Construction of backland facilities that require grading and paving would have the potential to increase erosion and deposition of soils in the harbor, as would the temporary storage of surcharge material on the landfills. Runoff of soils from the surface of these facility sites would be controlled by use of BMPs as described under **Impact WQ-1.2**. Paving the new landfills following the removal of surcharge material and the additional areas in the backlands would reduce, but not eliminate, the potential for runoff of sediments. Stormwater discharge monitoring in the Port (MBC 2005) has shown that the amount of suspended solids in storm runoff is typically higher than in dry weather drain discharges at some locations. However, the volume of the discharges would be low relative to the volume of harbor waters, suspended solids would settle out, and no beneficial uses would be impaired.

Soils transported from onshore construction sites would enter harbor waters primarily through storm drains. Most runoff would occur during storm events, although some could occur during use of water as part of construction activities. Standard BMPs would be used during these construction activities to minimize runoff of soils in compliance with the State General Permit for Stormwater Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ) and the Project-specific SWPPP described under **Impact WQ-1.2**. The small amount of soils that could reach harbor waters via storm drains would be rapidly dispersed by mixing with harbor waters in the immediate vicinity of the drain discharge. Effects of this runoff on DO would be minor and limited to the vicinity of the drain discharge locations due to the small amount of sediment and short duration of storm runoff. Runoff of soils from onshore construction activities is not expected to affect harbor water pH or nutrient levels because substances that could measurably alter pH or nutrient levels would not be present in the soils.

<u>CEQA Impact Determination</u>

Implementation of backland improvements has the potential to adversely affect harbor water quality in the immediate vicinity of storm drains and other locations where runoff of soils can enter the harbor. These construction activities, however, would generally not accelerate natural processes of wind and water erosion resulting in soil runoff or deposition that could not be contained or controlled onsite through implementation of BMPs to control runoff. Runoff from general construction activities would have short-term, localized impacts on water quality that would be less than significant under CEQA.

Mitigation Measures

As impacts on hydrology and water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology and water quality would be less than significant.

<u>NEPA Impact Determination</u>

Impacts of improvements on existing backlands are part of the NEPA Baseline and are not considered in the impact analysis under NEPA. In-water construction (including fill placement to create land), which is not part of the baseline, would have the potential to increase erosion of the fill surface and surcharge during storm events, resulting in soil runoff to harbor waters. Construction of terminal facilities on these fills also could result in runoff of soils. Impacts of that runoff would be short term, localized, and less than significant under NEPA.

Mitigation Measures

As impacts on hydrology and water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology and water quality would not occur for improvements of existing backlands. Impacts on hydrology and water quality during Project onshore construction on the Slip 1 and East Basin fill would be less than significant.

Operational Impacts

Impact WQ-1.3: Operation of Project facilities could result in violation of regulatory standards or guidelines.

Operation of terminal facilities would not result in any direct waste discharges to the harbor, other than stormwater discharges. However, the increased transportation activities (truck and rail) associated with the Project could increase the amount of particulate and chemical pollutants settling from the air and brought in by vehicles (e.g., tires, fuel and lubricant leaks, and brakes) and cargo on the larger paved area. A portion of the pollutants from these sources would enter East Basin, primarily through stormwater runoff. Stormwater discharge sampling in the POLB in 2005 (MBC 2005) showed that pollutants such as metals and semi-volatile organic compounds were present in rain runoff before it entered harbor waters. Only copper, lead, nickel, and zinc were found in concentrations that could have the potential to exceed the standards for marine waters at a few locations. No exceedances of water quality standards or objectives in receiving waters (i.e., the harbor) were reported for this sampling program. Project activities are unlikely to result in runoff of metals at concentrations that would exceed water quality standards.

Aerial deposition of pollutants from Project-related non-electric equipment, vehicle, and vessel operation would occur on land with a minor amount on the surface of harbor waters. Pollutants deposited on land could be washed into harbor waters in storm runoff. This deposition would represent a small amount of pollutants that would periodically enter the harbor. Past monitoring suggests that these inputs would not cause concentrations in harbor waters to exceed any standards or objectives, and no DDT or PCBs would be in the Project aerial fallout because these chemicals would not be used during Project operations.

Continued use of existing pollution controls and implementation of improved storm drain infrastructure on the new fill and where storm drains are replaced would reduce the potential for pollutants to enter the harbor. As described in the City of Long Beach Municipal Stormwater Permit, the Port will require all tenants to comply with pollution control measures in that permit and in the LBSWMP that are applicable for their facilities. Other sources of pollutants that could accumulate in sediments of the East Basin include accidental spills on land that enter storm drains and accidental spills from vessels while in East Basin. Impacts would depend on the material spilled, speed of cleanup, and sedimentation rate of the material.

The amount of vessel traffic in East Basin would nearly double compared to baseline conditions, representing a 3.4 percent increase in total vessel traffic in the harbor as a result of the Project. The amount of pollutants in clean water discharges from those vessels would be low because the Port prohibits discharge of polluted water or refuse to the harbor, but would add incrementally to the pollutants being discharged into harbor waters.

<u>CEQA Impact Determination</u>

Because the terminal operator would be required to implement pollution control measures, in compliance with the Port's Stormwater Program (Section 3.2.2.2), runoff from new and existing impervious surfaces would result in less than significant impacts to harbor sediments and marine water quality. Existing regulatory controls for runoff and storm drain discharges, as implemented by the Port's Stormwater Program, are designed to reduce impacts to water quality. Results from past stormwater monitoring (MBC 2005) indicate that the Project is not expected to result in significant impacts on water quality. Therefore, impacts would be less than significant under CEQA.

Potential runoff of pollutants from a large accidental spill to marine waters and sediments would be minimized through existing regulatory controls and is unlikely to occur during the life of the Project. The Release Response Plan prepared in accordance with the Hazardous Material Release Response Plans and Inventory Law (California Health and Safety Code, Chapter 6.95), which is administered by the LBFD, also regulates hazardous material activities within the Port. These activities are conducted under the review of a number of agencies and regulations including the USCG, fire department, and federal and state departments of transportation (49 CFR Part 176). These safety measures would minimize the likelihood of a large spill reaching the marine waters and sediments.

The small amount of pollutants in discharges from Project vessels would be controlled by existing regulations and would have less than significant impacts on water quality.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water quality would be less than significant.

<u>NEPA Impact Determination</u>

Impacts to water quality from increased vessel traffic and operation of Project facilities on the new landfills would be as described for CEQA, and less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on water quality would be less than significant.

Impact WQ-3.2: Operation of Project facilities would not result in increased flooding, which would have the potential to harm people or damage property or sensitive biological resources.

Although portions of the Project site are located within a 100-year flood zone, Project operations would not increase the potential for flooding onsite. Existing and new storm drains are designed to convey water from a 10-year storm. Runoff associated with a larger storm could exceed the capacity of the storm drain system, resulting in temporary and localized ponding. Site elevations, however, would remain generally the same as prior to construction, and the risk of flooding on existing backlands would not be increased above that under baseline conditions. For the new fill areas, the potential for flooding would be the same as on the existing backlands. Because the Project facilities would be part of a paved container terminal, any flooding that did occur would not result in a loss of life, substantial property damage, or harm to sensitive biological resources. The effects of pollutant runoff have been addressed under **Impact WQ-1.3**.

CEQA Impact Determination

Because the likelihood of flooding would not be increased by operations at Project facilities, flooding impacts would be less than significant under CEQA.

Mitigation Measures

As impacts of flooding would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts of flooding would be less than significant.

NEPA Impact Determination

Operation of Project facilities in harbor waters and on 54.6 acres of fill would not affect flooding. Less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts of flooding would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts of flooding would be less than significant.

Impact WQ-4.2: Operations have a low potential to accelerate natural processes of wind and water erosion and sedimentation, resulting in substantial soil runoff or deposition which would not be contained or controlled onsite.

Operation of terminal facilities on the new landfills and upgraded existing backlands on Middle Harbor would add approximately 54.6 acres of new paved landfill as well as small, newly paved areas on the existing backlands that would increase the amount of impervious surface. Paving of these surfaces would reduce the amount of soil that could run off to harbor waters from these areas as a result of wind or water erosion. Although some soil would be carried into the harbor via storm runoff from the small remaining unpaved areas (primarily landscaped areas), the Project would not result in substantial erosion and sediment deposition in harbor waters due to implementation of required sediment control measures, presence of vegetation to stabilize soils, and the small amount of unpaved area present.

CEQA Impact Determination

The reduction in unpaved surface area and the implementation of BMPs to control soil runoff as required by existing regulations would minimize erosion and soil runoff from the Project site. Consequently, impacts on hydrology and water quality would be less than significant under CEQA.

Mitigation Measures

As impacts on hydrology and water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology and water quality would be less than significant.

NEPA Impact Determination

Impacts on hydrology and water quality from operation of Project facilities on the new landfills would be as described for CEQA; less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on hydrology and water quality would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on hydrology and water quality would be less than significant.

3.3.2.4 Alternative 2 – 315-Acre Alternative

Effects of wharf demolition at Berths D29-D31, E23-E26, E12-E13, and F1-F3; dredging and excavation to deepen and widen Slip 3; reconstruction of wharves at Berths E24-E26; wharf upgrades at Berth E27; and placement of fill in Slip 1 and to extend Berth E24 during Phase 1 on hydrology and water quality would be the same as for the Project. However, no fill of the East Basin or excavation at Berth 201 would occur in Alternative 2, and effects of those construction activities on hydrology and water quality would be avoided. Operations of the new facilities would be the same as described for the Project, but the new surface area for facilities would be smaller.

CEQA Impact Determination

As described for the Project under **Impacts WQ-1.1 and WQ-1.2**, dredging, excavation, filling, new wharf construction, wharf reconstruction and upgrades, and backlands improvements during the construction of Alternative 2 would not violate any water quality standards or guidelines because all in-water work would be of short duration and affect a relatively small area, and both in-water and ground disturbing work would be conducted in accordance with Project-specific permits that include measures to minimize impacts to water quality. The amount of in-water work would be less than for the Project, and impacts of construction would be less than significant under CEQA.

As described for the Project under **Impact WQ-2**, circulation patterns in the Middle to Inner Harbor would change very little as a result of the dredging and filling activities. Alternative 2 would involve less fill and excavation than the Project, and this would result in even less effects on water movement. Impacts on hydrology would be less than significant under CEQA.

Construction and operations would not increase the potential for flooding onsite because drainage would be maintained as described for the Project under **Impacts WQ-3.1 and WQ-3.2**. Flooding impacts would be less than significant under CEQA. Ground disturbances and construction activities related to backland improvements and development and operations of new facilities on the new landfills (Slip 1 and end of Pier E) would not increase natural processes of wind and water erosion of upland soils. Measures to control and contain sediment runoff would be implemented during construction and operations. Any soils exposed as a result of upland construction and operations would be contained or controlled onsite as described under **Impacts WQ-4.1 and WQ-4.2** for the Project. Impacts would be less than significant under CEQA.

NEPA Impact Determination

Impacts from dredging, excavation, filling, new wharf construction, and wharf reconstruction and upgrades during construction of Alternative 2 would be the same as described for the CEQA determination (**Impacts WQ-1.1 and WQ-1.2**), but would occur in a smaller area. Less than significant construction impacts would occur under NEPA.

As described for the Project under **Impact WQ-2**, circulation patterns in the Middle to Inner Harbor would change very little as a result of the dredging and filling activities. Alternative 2 would involve less fill and excavation than the Project, and this would result in even less effects on water movement. Impacts would be less than significant under NEPA.

Construction and operations of the new landfills in Alternative 2 (smaller than in the Project) would not increase the potential for flooding onsite because drainage would be maintained as described for the Project under **Impacts WQ-3.1 and WQ-3.2**. Flooding impacts would be less than significant under NEPA.

Ground disturbances and construction activities related to development and operations of new facilities on the new landfills (Slip 1 and end of Pier E) would not increase natural processes of wind and water erosion as described under **Impacts WQ-4.1 and WQ-4.2** for the Project. Measures to control and contain sediment runoff would be implemented during construction and operations. Impacts would be less than significant under NEPA.

3.3.2.5 Alternative 3 – Landside Improvements Alternative

Alternative 3 would redevelop existing terminal areas on Piers E and F and convert underutilized land north of the Gerald Desmond Bridge and Ocean Boulevard within the Project site to a container yard. No in-water activities, including dredging, filling Slip 1 and the East Basin, new wharf construction, wharf upgrades, or channel and berth deepening would occur.

CEQA Impact Determination

Impacts during construction and operation of backlands improvements on water quality would be as described for the Project. These activities (including the increase in vessel calls) would not violate any water quality standards or guidelines, increase the potential for flooding, or increase erosion, and impacts would be less than significant under CEQA.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on hydrology and water quality would occur.

3.3.2.6 Alternative 4 – No Project Alternative

The No Project Alternative would not include construction of upland site improvements, including rail improvements and construction of the Pier E Substation, or in-water activities (i.e., dredging, filling of Slip 1 and the East Basin, and/or new wharf construction). However, forecasted increases in cargo would still occur under this alternative. Operational impacts associated with the following activities would occur: cargo ships that currently berth and load/unload at the terminal would continue to do so; terminal equipment would continue to handle cargo containers; and trucks would continue to transport containers to outlying distribution facilities.

CEQA Impact Determination

No new construction or backlands operation activities would occur within the Project area to change water circulation, flooding potential, runoff of pollutants, and erosion. Thus, no impacts on water quality would occur under CEQA. Although the amount of vessel traffic would increase by 127 vessel calls per year above the CEQA Baseline (52 less than for the Project) at the existing berths, the discharge of pollutants from those vessels would be less than significant as described under **Impact WQ-1.3**.

NEPA Impact Determination

Under this alternative, no development would occur within the in-water Project area, and the number of vessel calls per year would be less than the NEPA Baseline. Therefore, no impacts on water quality would occur under NEPA.

3.3.3 Cumulative Impacts

The region of influence for cumulative impacts on marine waters is the Long Beach/Los Angeles Harbor (Inner and Outer Harbor areas). Cumulative projects including the Piers G & J Redevelopment Project, Pier S Marine Terminal Project, Gerald Desmond Bridge Replacement Project, Berths 136-149 Marine Terminal, Evergreen Redevelopment/YTI Wharf Upgrade Project, Berths 97-109 Container Terminal Project, Channel Deepening Project, Pacific Los Angeles Marine Terminal, Cabrillo Way Marina (Phase 2) Project, Pan- Pier 300 APL Container Terminal Expansion Project, Berths 212-224 YTI Project, Artificial Reef Project, and Berths 121-131 Yang Ming Container Terminal (Table 2.1-1 and Figure 2.1-1) would directly affect marine water quality and hydrology through fill (approximately 277 acres, of which about 105 acres are completed or under construction), dredging, wharf construction/ reconstruction, rocky dike construction, and other construction activities (e.g., boat slips and artificial reef). All of the projects in Table 2.1-1 would have the potential to indirectly affect harbor water quality through runoff of sediments and pollutants during construction and operations activities on land.

Construction activities in harbor waters from the projects listed above, such as dredging and wharf construction, would cause suspension of sediments that could alter water quality parameters (e.g., DO, nutrients, and turbidity). These effects are generally of short duration, affect small localized areas that are usually not adjacent to each other during construction, and do not occur simultaneously for all projects. Cumulative impacts of such disturbances on water quality would be less than significant because the effects are dispersed in time and space and are not expected to exceed regulatory water quality standards. Furthermore, sampling in 2000 indicated that water quality in the harbor has not been degraded even with continued developments over more than 10 years. In-water construction activities for the Project would have less than significant impacts and would not make a cumulatively considerable contribution to effects on water quality.

Temporary disturbances on land during construction of cumulative project facilities would add a small amount of soils in runoff to harbor waters. Runoff from these projects, however, would not occur simultaneously, but rather spread over time so that construction-related runoff to harbor waters would be dispersed in time and space. Cumulative impacts would be less than significant due in part to this dispersal and also due to the small amount of land affected for each project and to implementation of runoff control measures required in project permits, such as SWPPPs. Runoff during operations of the cumulative projects could change as industrial uses and the amount of paving change, but such changes would be small since most areas are already developed and would be merely redeveloped. Thus, cumulative impacts to water quality would be less than significant. Project backland upgrades and railyard construction and operation of these facilities would have less than significant impacts on water quality, and the Project would not make a cumulatively considerable contribution to effects on water quality.

Several of the cumulative projects would add vessel traffic to the harbors above baseline levels that would increase the potential for discharges and accidental spills that could affect water quality. The cumulative impact of discharges from vessels would be less than significant due to the small number of vessels relative to the total entering the harbor annually and due to implementation of existing discharge controls. The small (3.4 percent) increase in vessel traffic in the harbor caused by the Project would not make a cumulatively considerable contribution to effects on water quality.

Five of the cumulative projects involve placement of fill in harbor waters, and this would not substantially alter water circulation patterns because the areas to be filled are small (less than 53 acres each), generally in dead-end slips, and scattered throughout the harbor. Thus, placement of fill in harbor waters would result in less than significant cumulative impacts. The Project would contribute 54.6 acres, or approximately 16 percent, of the approximately 332 acres of fill recently completed or proposed for the harbor (including the Project). Filling of Slip 1 and a part of the East Basin would not make a cumulatively considerable contribution to impacts on water circulation in the harbor because the area filled would not affect flow in other parts of the harbor.

The potential for flooding would not be adversely affected by the cumulative projects, and cumulative impacts would be less than significant. The Project would not increase the potential for flooding and thus would not make a cumulatively considerable contribution to effects of flooding.

3.3.4 Mitigation Monitoring Program

As no mitigation measures are required to address impacts on water quality, no mitigation monitoring program is required.

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3.4 BIOTA AND HABITATS

Marine biological resources in the Long Beach/Los Angeles Harbor (Inner and Outer Harbor Areas) have been studied for over 30 years. These studies, along with water quality analyses, have shown an improvement in habitat quality over time (MEC Analytical Systems, Inc. 2002).

3.4.1 Environmental Setting

Marine habitats within Long Beach Harbor near the Project site consist primarily of deep soft bottom, hard substrate (rock riprap, sheetpiles, and pilings), and water column environments. Terrestrial habitats in the Project area are all developed (industrial). The biological resources within each of these habitat types are described below as well as the sensitive species that are present in the harbor and that could occur at or adjacent to the Project site. Information provided on the habitats is not always specific to the Project site because: (1) many organisms move freely throughout the harbor, particularly those in the water column; (2) data are only available from specific sampling locations; and (3) Project effects could extend beyond the Project's boundaries (e.g., noise and vibration). Biological resource sampling throughout the harbor is not undertaken on an annual basis, with the most recent surveys completed in 2000 (MEC Analytical Systems, Inc. 2002). However, use of 2000 and earlier data to approximate conditions in the 2005 baseline year is appropriate because conditions in the harbor have been relatively consistent during recent decades. For example, a comparison of 1986-87 data (MEC Analytical Systems, Inc. 1988) and earlier studies to data from 2000 shows little difference in biological conditions (MEC Analytical Systems, Inc. 2002).

3.4.1.1 Area of Influence

The area of influence for Project effects on biota and habitats is essentially the same as for water resources (i.e., the Inner and Outer Harbor waters of Long Beach Harbor [Section 3.3]), plus the uplands within and adjacent to the Project site. Although Long Beach Harbor is adjacent to the Los Angeles Harbor, and the two are oceanographically connected via Cerritos Channel and the outer harbors, measurable effects of the Middle Harbor Project (i.e., lighting, noise, and physical habitat alteration) on marine organism distribution and abundance are not expected to affect waters of Los Angeles Harbor due to the several-mile distance (Figure 1.5-1). Mobile species, such as fish and birds, can and do move throughout the harbor, and this movement would not be limited by the Project.

3.4.1.2 Setting

Terrestrial Habitats

Upland areas where backland improvements would occur are previously developed areas that provide limited terrestrial habitat for wildlife and plants. Vegetation on uplands in the Project area is primarily landscape plantings and weedy species in unpaved areas. No natural or sensitive plant communities are present. Wildlife use of the Project site and other developed areas is generally limited to feral cats, rats and mice, and birds associated with development such as gulls, American crow (*Corvus brachyrhynchos*), rock dove (*Columba livia*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), Brewer's blackbird (*Euphagus cyanocephalus*), and swallows (MEC Analytical Systems, Inc. 2002). In addition, several species of bats could be present in the Middle Harbor area. Bats in urban or industrial areas often use crevices in bridges, such as expansion joints, as roosts and nursery locations. They can be present year-round or seasonally for breeding during summer or hibernating in winter. The closest bridge to the Project site is the Gerald Desmond Bridge located at the northwest corner of the Project area (Figure 1.5-2). Other roadway bridges that could provide habitat for bats are located to the northeast, east, and west of the Project area.

Marine Benthic Communities

Soft Bottom. Organisms that live in (benthic infauna) and on (benthic epifauna) bottom sediments are important to overall community productivity and diversity and provide a food source for fish, invertebrates, and other organisms. The density (number of individuals per unit area) and species composition of these organisms is influenced by sediment grain size, amount of nutrients, water depth, pollutant levels in the sediments and overlying water, and time since the last disturbance by dredging. Harbor-wide, the benthic infauna in 2000 was dominated by polychaete worms with crustaceans moderately abundant, and mollusks plus other taxa least abundant (MEC Analytical Systems, Inc. 2002). Most of these organisms are small, but can be very abundant. In Slip 1, the mean infaunal abundance from the year 2000 baseline surveys was 900 organisms/square meter (organisms/m^2), representing 12 species, and biomass was 15.5 grams/square meter (g/m^2) (MEC Analytical Systems, Inc. 2002). This area has not been dredged in about 35 years, and statistical analyses (cluster analysis) indicated this community was distinct from the other sampling areas, likely due to the length of time since the last dredging. In the channel south of East Basin, the mean infaunal abundance was higher, 2,840 organisms/m^2, representing 36 species, and biomass was 39.5 g/m^2. This station was statistically similar to stations in Long Beach West Basin and Southeast Basin (MEC Analytical Systems, Inc. 2002). Epifaunal macroinvertebrates in the area just south of East Basin were characterized by eight species and a mean of 247 organisms/trawl. The most abundant species were tuberculate pear crab (*Pyromaia tuberculata*) and black-spotted shrimp (*Crangon nigromaculatus*). Fish associated with soft bottom habitats are discussed in the Water Column section below.

Hard Substrate. Hard substrates provide surfaces for attachment of invertebrates and algae as well as shelter for mobile invertebrates and fish. Organisms occurring on hard substrates in the harbor show vertical zonation (changes in species with changes in water depth) similar to rocky shores. Substrate type (e.g., vertical concrete or sloping rock riprap) influences the species composition and abundance at specific locations (MEC Analytical Systems, Inc. 2002). Benthic organisms generally can completely cover the surface of hard substrates and even grow on each other, resulting in high numbers of individuals in a unit of area. Many of these organisms have hard shells that increase the biomass (weight) of organisms per unit area. Two riprap locations were sampled in the Long Beach Middle Harbor area (West Basin near the east end of the Naval Mole and Southeast Basin) and one was sampled in Cerritos Channel (MEC Analytical Systems, Inc. 2002). Although no sampling stations were located at the Project site, the MEC Analytical Systems, Inc. (2002) data described in this section are expected to be representative.

The mean abundance of invertebrates at these locations ranged from 6,000 organisms/m^2 in Cerritos Channel to 12,400 organisms/m^2 in Southeast Basin (upper and lower intertidal and subtidal zones combined). The mean biomass for the two intertidal zones at these three stations was 3,740 g/m^2, while the mean biomass in subtidal areas was 13,293 g/m^2. A total of 35 species were collected in Cerritos Channel with 49 species in West Basin. The dominant species in the upper intertidal zone were acorn barnacles (*Balanus glandula* and *Chthamalus fissus*), along with a snail (*Littorina* spp.) and a limpet (*Collisella scabra*). In the lower intertidal zone, the same species were common as in the upper intertidal, along with the Mediterranean mussel (*Mytilus galloprovincialis*) and a clam (*Lasaea subviridis*) (except in Cerritos Channel). The thatched barnacle (*Tetraclita rubescens*) was common in Southeast Basin, and a snail (*Tegula funebralis*) was common in West Basin. In the subtidal zone, acorn barnacles, crustaceans, and Mediterranean mussels were the most common species. Snails, urchins, and algae were also represented.

Algae observed during the riprap surveys included 10 species in the Long Beach West Basin and seven in Cerritos Channel. The species in West Basin were feather boa kelp (*Egregia menziesii*), giant kelp (*Macrocystis pyrifera*), sargassum (*Sargassum muticum*), brown algae (*Colpomenia sinuosa*, *Dictyota flabellata*, and *Giffordia granulosa*), a red alga (*Tiffaniella snyderiae*), a green alga (*Enteromorpha compressa*), and two coralline algae (*Corallina pinnatifolia* and *C. vancouveriensis*). In Cerritos Channel, the species were feather boa kelp, sargassum, three brown algae (*C. sinuosa*, *D. flabellata*, and *Ectocarpus parvus*), and a green alga (*Bryopsis hypnoides*). None of the year 2000 kelp transects in Long Beach Harbor were located near the Project site. The transect in Southeast Basin found nine species, while Channels 2 and 3 of the Inner Harbor had six species, and Cerritos Channel had four species.

Water Column (Plankton and Fish)

Plankton. The water column provides habitat for plankton (small floating animals and plants) and fish. Phytoplankton (plant plankton) tend to be less diverse in the Inner Harbor than in the Outer Harbor, but productivity can be higher in the Inner Harbor due to warmer water temperatures, nutrient inputs, and reduced circulation (HEP 1980). In the Inner Harbor, the dominant zooplankton (animal plankton) species are copepods and are typified by seasonal peaks and declines (USACE 1985).

The distribution and abundance of ichthyoplankton (fish eggs and larvae) varied over space and time in the Long Beach/Los Angeles Harbor in 2000 (MEC Analytical Systems, Inc. 2002). Larvae were most abundant in spring and summer (May and August), while fish eggs were most abundant in winter and summer (February and August). The most abundant larvae were gobies (four species), northern anchovy (*Engraulis mordax*), California clingfish (*Gobiesox rhessodon*), queenfish (*Seriphus politus*), blennies (*Hypsoblennius* spp.), and white croaker (*Genyonemus lineatus*), while the most abundant fish eggs were unidentified croaker and unidentified fish. In the Long Beach Middle Harbor channel, the dominant larval fish were bay goby (*Lepidogobius lepidus*), northern anchovy, white croaker, queenfish, other gobies, and blennies.

Fish. Seventy-four species of juvenile/adult fish were collected in the harbor during the year 2000 baseline study (MEC Analytical Systems, Inc. 2002). Of these, northern anchovy, white croaker, and queenfish were the dominant species. In Lampara net samples, which collect pelagic (water-column-dwelling) fish, northern anchovy comprised 68 percent of the catch while in otter trawl samples, which collect demersal (bottom-dwelling) fish, northern anchovy, white croaker, and queenfish accounted for 89 percent of the catch. Abundance of fish was greater in summer than in winter. At the Middle Harbor channel station, the mean Lampara net catch was 982 fish, dominated by northern anchovy (87 percent) with white croaker, Pacific sardine (*Sardinops sagax*), topsmelt (*Atherinops affinis*), and queenfish also abundant. For otter trawl sampling, the mean catch was 332 fish, with white croaker (67 percent) the dominant species followed by northern anchovy and queenfish. The overall abundance of fish in Long Beach/Los Angeles Harbor was estimated to be 44.6 million (MEC Analytical Systems, Inc. 2002).

Birds and Marine Mammals

Birds. The harbor area is used by numerous species of birds. Water-associated birds use the water surface for resting, and forage over or in the water. Some species also rest or roost on breakwaters and other structures in the harbor. The year 2000 baseline study noted 69 species that are dependent on marine habitats and another 30 species that are not (MEC Analytical Systems, Inc. 2002). The most abundant guild of birds was gulls, with western gull (*Larus occidentalis*) and Heermann's gull (*Larus heermanni*) the most common. The next most abundant guilds were aerial fish foragers such as elegant tern (*Sterna elegans*) and California brown pelican (*Pelecanus occidentalis californicus*); and waterfowl such as western grebe (*Aechmophorus occidentalis*), Brant's cormorant (*Phalacrocorax penicillatus*), and surf scoter (*Melanitta perspicillata*). Birds reached their highest abundance in fall and winter.

In the Project area, the most abundant species were western gull, western grebe, and Heermann's gull. Other gulls observed were herring gull (*Larus argentatus*), mew gull (*Larus canus*), California gull (*Larus californicus*), and ring-billed gull (*Larus delawarensis*). Great blue herons (*Ardea herodias*) were present along the riprap from June through January but were more abundant in late summer to fall. Belted kingfishers (*Ceryle alcyon*) were present all year.

Marine Mammals. All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972. The only marine mammals likely to be present in the Long Beach Middle Harbor area are the California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*) based on observations during the 2000 surveys (MEC Analytical Systems, Inc. 2002).

Several sea lions and one harbor seal were observed in or near the Project area during the year 2000 baseline surveys. Outside the breakwater, a variety of marine mammals use nearshore waters. These include the gray whale (*Eshrichtius robustus*), which migrates from the Bering Sea to Mexico and back each year, and the blue whale (*Balaenoptera musculus*). This and other species of baleen whales generally are found as single individuals or in pods of several individuals. Toothed whales, particularly dolphins, can be found in larger groups up to a thousand or more (Leatherwood and Reeves 1983). Two species of dolphin commonly found in coastal areas near Long Beach and Los Angeles are the Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) and common dolphin (*Delphinus delphis*).

The NMFS has records of 65 vessel strikes with whales in California coastal waters for 1982 through 2007 (NMFS 2007a). The total number of strikes per year ranged from none to seven and averaged 2.6, but the actual number is likely to be greater because not all strikes are reported. Of the recorded strikes, gray whales accounted for about 42 percent and blue whales accounted for 15 percent. The normal swimming speed of blue whales is 22 kilometers per hour (km/hr), which is approximately 10 knots; however, blue whales can swim up to 48 km/hr when alarmed (Wilson and Ruff 1999). When vessel speed exceeds 10 knots, strikes are usually fatal (personal communication, Joe Cordaro 2008).

Table 3.4-1. Special Status Bird Species in the Project Area

Common Name	Scientific Name	Status[1]		Habitat Use
		Federal	State	
California least tern	*Sternula antillarum browni*	E	E, FP	Nests at designated site on Pier 400; forages over shallow water near nest site; present April-August
California brown pelican	*Pelecanus occidentalis californicus*	E	E	Roosts on breakwaters; forages over open water; rests on water or structures; present all year
American peregrine falcon	*Falco peregrinus anatum*	Delisted	E, FP	Nests in the Inner Harbor on Vincent Thomas, Gerald Desmond, and Schuyler F. Heim bridges; forages on birds throughout the harbor
Western snowy plover	*Charadrius alexandrinus nivosus*	T	CSC	Several migrants in California least tern nesting site at Pier 400, but no nesting in 2003-2007
Black skimmer	*Rynchops niger*	--	CSC	Nested on Pier 400 in 1998-2000 and 2004; forages over water near nests; present all year
Burrowing owl	*Athene cunicularia hypugea*	--	CSC	One observed on riprap in Long Beach Outer Harbor in 2000; one trapped on Pier 400 in 2003 and 2004; observed/trapped on Pier 400 in 2005-2007, but no confirmed nesting
Loggerhead shrike	*Lanuis ludovicianus*	--	CSC	A few in Inner Harbor on riprap or dock/piling habitat; no nesting habitat in Project area

Note:
1. E = endangered; T = threatened; CSC = California Species of Special Concern (nesting populations for birds in this table); FP = fully protected

Sources: MEC Analytical Systems, Inc. 2002; Keane Biological Consulting 2003, 2005b, 2007a, 2007b; CNDDB 2008.

Special Status Species

Several federally- and state-listed threatened or endangered or other special status bird species are known to be present, at least seasonally, in the harbor (Table 3.4-1). Many birds are protected under the Migratory Bird Treaty Act; those that also have special status are included in Table 3.4-1. Other migratory birds were discussed previously in the sections on Birds and Marine Mammals and on Terrestrial Habitats.

California Least Tern. The California least tern was federally listed as endangered in 1970 and state listed as endangered in 1971. Loss of nesting and nearby foraging habitat due to human activities caused a historical decline in the number of breeding pairs (USFWS 1992). The biology of this species in the harbor area has been described extensively (USACE 1990; USACE and LAHD 1992; Keane Biological Consulting 2003, 2005a) and is summarized below along with information from nesting and foraging studies in the harbor.

The least tern is a migratory species that is present and breeds in California from April through August. The species was documented to have nested during the summer on Terminal Island (including Pier 300) since at least 1974 (Keane Biological Consulting 1999). In 1979, the Los Angeles Harbor Department began providing nesting habitat for the species and entered into a Memorandum of Agreement (MOA) with the USFWS, USACE, and CDFG for management of a 15-acre least tern nesting site starting in 1984. The number of nests in the harbor was 1,322 in 2005 (Keane Biological Consulting 2005b). Most of the 2005 nests were within the 15.7-acre fenced nesting site, although 25 were located in the adjacent area to the west.

Several foraging studies have been conducted in the harbor. The 1982, 1984, and 1985 surveys found that least terns foraged over shallow water (generally less than 20 feet deep) in the Outer Harbor, especially near the Pier 400 least tern nesting site, but not in the Inner Harbor (Keane Biological Consulting 1997). A study in 1997 and 1998 (Keane Biological Consulting 1998) found that the least terns used the West Basin of Long Beach Harbor as well as the Pier 300 Shallow Water Habitat, Seaplane Lagoon, and the Gap (area between Naval Mole and Pier 400 Transportation Corridor). Both shallow and deep water areas were used, probably in response to localized fish abundance within the size range suitable for least terns. These studies have shown that shallow water areas (less than 20 feet deep) provide important foraging areas for the least tern.

California Brown Pelican. The California brown pelican was federally listed as endangered in 1970 and was state listed as endangered in 1971. Low reproductive success attributed to pesticide contamination that caused thinning of eggshells was the primary reason for their listing. After the use of DDT was prohibited in 1970, the population began to recover (USACE and LAHD 1992). California brown pelican abundance has increased since surveys conducted in 1973 found the pelicans comprised only 3.8 percent of the total bird observations in the ports (HEP 1980). In 2000, pelicans accounted for 9.5 percent of the birds observed (MEC Analytical Systems, Inc. 2002). The USFWS published a 90-day finding for the California Brown Pelican delisting petition, initiated a status review to determine if delisting is warranted (see 71 FR 29908 dated 24 May 2006), and has now proposed to delist the species (USFWS 2008).

The brown pelican does not breed in the harbor area. The only breeding locations in the U.S. are at West Anacapa Island and Santa Barbara Island, although a few have begun nesting at the south end of the Salton Sea (CDFG 2005, Patten et al. 2003). Breeding also occurs at offshore islands and along the mainland of Mexico.

Brown pelicans use the harbor year-round, but their abundance is greatest in the summer when post-breeding birds from Mexico arrive. The highest numbers are present between early July and early November, when several thousand can be present (MBC 1984). Pelicans can use all areas of the harbor, but they prefer to roost and rest on harbor breakwater dikes, particularly the Middle Breakwater (MBC 1984, MEC Analytical Systems, Inc. 1988 and 2002). Brown pelicans were observed in Middle Harbor from April through January during the year 2000 baseline surveys. This species forages over open waters for fish such as the northern anchovy.

Western Snowy Plover. The Pacific coast population of the western snowy plover was federally listed as threatened in 1993 (USFWS 1993). This small shorebird nests on coastal beaches from southern Washington to southern Baja California and winters along the coast of California and Baja California (NatureServe 2005). The birds forage on invertebrates (crustaceans) in or near shallow water along the shore (USFWS 1993; Small 1974). Western snowy plovers were observed on Pier 400 during the least tern nesting surveys in 2003 through 2007. The plovers were not nesting and appear to have been using the area as a stop-over during migration (Keane Biological Consulting 2003, 2005a, 2007a and 2007b). Critical habitat was designated for this species in December 1999 (USFWS 1999) and only included one location, the mouth of Malibu Creek, within coastal Los Angeles County. Revised critical habitat was proposed in 2004 and designated in September 2005 (USFWS 2005). The designation did not include any areas in the POLB.

American Peregrine Falcon. Peregrine falcons, state-listed as endangered, nest in the Inner Harbor area and forage on birds. A pair was observed nesting on the Schuyler F. Heim Bridge in 2000, and individuals were observed in Long Beach West Basin, Southeast Basin, and Cerritos Channel during those surveys (MEC Analytical Systems, Inc. 2002). Although none were observed in the Project area during the year 2000 baseline surveys, individuals of this species could forage in the area at times and have used the Gerald Desmond Bridge for nesting in the past.

Other Special Status Species. The black skimmer, a California Species of Special Concern, has nested on Pier 400 in recent years (MEC Analytical Systems, Inc. 2002; Keane Biological Consulting 2005b) but not in the last three years (Keane Biological Consulting 2007a and 2007b). This species was present in the harbor all year in 2000, but numbers were greatest during the summer nesting season. The loggerhead shrike and burrowing owl could be visitors to the Project area, although none were observed there during the year 2000 surveys. Townsend's big-eared bat (*Corynorhinus townsendii*), a state Species of Special Concern, may be present in the area and could use the Gerald Desmond bridge for roosting.

The blue whale, federally listed as endangered, feeds off the coast of California during the summer (NMFS 2008). Their abundance in the eastern North Pacific is estimated at 1,700 individuals, and the primary threats to the species are incidental vessel strikes and fisheries interactions. Of the recorded vessel strikes (NMFS 2007a), blue whales accounted for 15 percent, or less than one every two years.

No sea turtles have been observed within the San Pedro Bay Ports during more than 20 years of biological surveys (MEC Analytical Systems, Inc., 1988 and 2002; MBC 1984). However, several species have regional distributions in southern California. Therefore, it is possible that sea turtles could be occasional visitors to the offshore and Outer Harbor areas of the San Pedro Bay Ports. Sea turtle species found in the eastern Pacific Ocean include loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys olivacea*) (NMFS 2007a). The leatherback sea turtle is federally listed as endangered, and the other three species are listed as threatened. Loggerhead and green sea turtles inhabit tropical and temperate waters throughout the world, and green sea turtles are found primarily near the coast and around islands, especially in areas with seagrass beds. Leatherback sea turtles occur worldwide with the largest north-south range of all sea turtle species. Olive ridley sea turtles inhabit tropical waters in the Pacific, Indian, and Atlantic oceans and are typically found offshore (NMFS 2007b). In 2006, a juvenile green sea turtle was found in Alamitos Bay, approximately six miles southeast of Middle Harbor (K. Helin, Grunion Gazette 18 September 2006). The turtle was radio tagged and released in October 2006 (Coastal Resources Management 2007). It moved south to the San Clemente area and then back to Alamitos Bay. In August 2008, several sea turtles that appeared to be green sea turtles were observed in the San Gabriel River at a power plant cooling water discharge (Aquarium of the Pacific 2008).

Wildlife Movement Corridors

Long Beach Harbor does not provide any terrestrial wildlife movement corridors. However, some marine fish species, such as halibut, jack smelt, and topsmelt, likely move into and out of the harbor for spawning, nursery, and foraging but not following specific migration corridors. Several whale species migrate along the coast of California, including the grey whale and blue whale.

Wetlands and Other Special Habitats

Wetlands. No wetlands as defined by the USACE are present in the Project area, including salt marshes. The closest salt marsh is the Cabrillo Salt Marsh in the western part of Los Angeles Harbor. Surface waters in the Project area are marine, and no freshwater marshes or wetlands are present.

Eelgrass. Eelgrass (*Zostera marina*) is a rooted aquatic plant that inhabits shallow soft bottom habitats in quiet waters of bays and estuaries as well as sheltered coastal areas (Dawson and Foster 1982). It can form dense beds that provide substrate, food, and shelter for a variety of marine organisms. Most eelgrass beds in bays or estuaries are found in water less than 20 feet deep with light being the primary limiting factor. Eelgrass beds are considered “special aquatic sites” under the Clean Water Act. Surveys of the harbor in 2000 found eel grass beds in Los Angeles Harbor along Cabrillo Beach and on the east side of Pier 300 (MEC Analytical Systems, Inc. 2002). No eelgrass beds are known to be present in Long Beach Harbor, although a few plants were observed in Cerritos Channel during the riprap surveys (MEC Analytical Systems, Inc. 2002). Soft bottom habitat that could support eelgrass in the Project area is at water depths of approximately 45 feet or greater, which is beyond the limit where light is sufficient for its growth.

Invasive Species

Invasive species can compete with or prey upon native species and thus alter the local ecology, which can have economic effects as well. At least 46 invasive aquatic species have become established in waters of the Long Beach/Los Angeles Harbor (Gregorio and Layne 1997). The primary source of these organisms is likely to have been discharges of ballast water from cargo vessels using the ports (NRC 1996; USCG 1998). Other potential vessel sources include hulls, anchors and chains, piping and tanks, propellers, and suction grids (grates that cover water intakes), while other non-vessel sources include aquarists and the restaurant live fish trade. During the year 2000 baseline surveys, 25 non-native species of invertebrates were collected in the infaunal and macroinvertebrate samples (MEC Analytical Systems, Inc. 2002). Four invasive invertebrate species have been found in the sediments of Slip 1, and another nine species were found in the riprap samples.

The non-native alga, sargassum (*Sargassum muticum*), was recorded in the Long Beach Inner and Middle Harbor during the year 2000 baseline kelp and macroalgae surveys, and the alga, *Undaria pinnatifida*, was found in Channel 3 (MEC Analytical Systems, Inc. 2002). Another non-native sargassum (*S. filicinum*) has recently been found in Long Beach Harbor (Miller 2006). The invasive alga *Caulerpa taxifolia* has not been reported from the Long Beach/Los Angeles Harbor.

Significant Ecological Areas

The County of Los Angeles has established Significant Ecological Areas (SEAs) to preserve a variety of biological communities for public education, research, and other non-disruptive outdoor uses. The only designated SEA in the Long Beach/Los Angeles Harbor is Pier 400, Terminal Island for the California least tern nesting site (Los Angeles County 2005). No SEAs occur in the Project region. SEAs do not preclude limited development that is compatible with the biological community. Policies and regulations for SEAs, however, do not apply within city boundaries.

Essential Fish Habitat

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) has been prepared. The Middle Harbor Project would be located within an area designated as EFH for two Fishery Management Plans (FMPs): Coastal Pelagics Plan; and Pacific Coast Groundfish Management Plan. Of the 94 species federally managed under these plans, eight are known to occur in the Long Beach Harbor area and could be affected by the proposed Project (Table 3.4-2).

One of the five species in the Coastal Pelagics FMP (northern anchovy) is common in the Project area, with adults, eggs, and larvae present. Pacific sardine are also common in this part of the harbor. Both species support a commercial bait fishery in the Outer Harbor. Adult jack mackerel are present and likely prey on small northern anchovy. Adult Pacific mackerel are also fairly common throughout the harbor. None of the eight Pacific Groundfish FMP species are common in the Project area (MEC Analytical Systems, Inc. 2002; and 1988; SAIC and MEC 1997), and none of these species are known to spawn in the harbor.

3.4.1.3 Regulatory Setting

Clean Water Act. This Act (33 United States Code [U.S.C.] Section 1344) provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. The act sets up a system of water quality standards, discharge limitations, and permit requirements. Activities that have the potential to discharge dredge or fill materials into Waters of the U.S., including wetlands, are regulated under Section 404 of the Act, as administered by USACE. A Section 401 certification or waiver from the governing RWQCB is also necessary for issuance of Section 404 permits. A Section 404(b)(1) alternatives analysis has been prepared for the Project (Appendix E) and clearly identifies the least environmentally damaging practicable alternative (LEDPA). A formal wetland and waters of the U.S. delineation is conducted in support of permit applications submitted to USACE and the RWQCB.

California Porter-Cologne Act. This Act (State Water Code Sections 13000 et seq.) is the basic water quality control law for California and works in concert with the federal Act. The state Act is implemented by the SWRCB and its nine regional

Table 3.4-2. Fisheries Management Plan Species in the Project Area

Common Name	Scientific Name	Notes
Coastal Pelagics Fishery Management Plan		
Northern anchovy	*Engraulis mordax*	Abundant throughout harbor and in Project area in 2000[1]
Pacific sardine	*Sardinops sagax*	Common throughout in harbor but rare in Project area in 2000[1]
Pacific (chub) mackerel	*Scomber japonicus*	Common throughout harbor and in Project area in 2000[1]
Jack mackerel	*Trachurus symmetricus*	Common in inner to middle harbor and uncommon in Outer Harbor, primarily in deep water[1]
Pacific Coast Groundfish Fishery Management Plan		
English sole	*Parophrys vetulus*	Rare, 5 collected in Outer, Middle, and Inner Long Beach Harbor in 1994-95[2]
Pacific sanddab	*Citharichthys sordidus*	Rare in Project area in 2000; 2 collected near East Basin[1]
Big skate	*Raja binoculata*	Rare in Project area; 1 collected[1]
Black rockfish	*Sebastes melanops*	Rare, 1 collected in Southeast Basin[1]
Calico rockfish	*Sebastes dalli*	Rare, 1 collected in Southeast Basin[2]
Vermillion rockfish	*Sebastes miniatus*	Rare; 1each collected near East Basin, Southeast Basin, and in West Basin in 2000[1]
California scorpionfish	*Scorpaena guttata*	Rare; 1 collected near East Basin in 2000[1]
California skate	*Raja inornata*	Rare; 1 collected in Southeast Basin and 1in West Basin in 2000[1]

Sources:
1. MEC Analytical Systems, Inc. 2002.
2. SAIC and MEC 1997.

boards which implement the permit provisions of Section 402 and certain planning provisions of Sections 205, 208, and 303 of the federal Act. This means that the state issues one discharge permit for purposes of federal and state law. Permits for discharge of pollutants are officially called NPDES permits. Anyone who is discharging waste or proposing to discharge waste that could affect the quality of state waters must file a “report of waste discharge” with the governing RWQCB.

Additional water quality permitting requirements under the Porter-Cologne Act may include an NPDES General Construction Activities Stormwater Permit (Section 3.3, Hydrology and Water Quality).

Rivers and Harbors Appropriations Act. This Act regulates construction in navigable waters of the U.S., including dredging, filling, and obstructions. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as a means to transport interstate or foreign commerce. Section 10 of the Act requires permits for all structures, such as riprap, and activities, such as dredging, that could affect navigation. Under Section 10, the USACE issues permits for construction, dumping, and dredging in navigable waters as well as construction of piers, wharves, weirs, jetties, outfalls, aids to navigation, docks, and other structures. Other agencies involved in the coordination of the Rivers and Harbors Appropriations Act include EPA, and state and local agencies.

Federal Endangered Species Act. The ESA of 1973 (16 U.S.C. 1531-1543), as amended, provides for the conservation of endangered and threatened species and the ecosystems they inhabit. The USFWS and NMFS share responsibilities for administering the ESA. Section 9 prohibits taking of species federally listed as threatened or endangered. A take is defined as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct, and includes habitat modification or degradation that could potentially kill or injure wildlife by impairing essential behavioral patterns, including breeding, feeding, or sheltering. A take incidental to otherwise lawful activities can be authorized under Section 7 when there is federal involvement and under Section 10 when there is no federal involvement.

Section 7 of the ESA requires federal agencies to consult with and seek the assistance of the Secretary of the Interior or Secretary of Commerce to ensure that actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of critical habitat for these species. The Biological Opinion issued at the conclusion of that consultation, depending on the outcome of the consultation, would include an incidental take statement authorizing take incidental to permitted activities and required terms and conditions for minimizing take.

Magnuson-Stevens Fishery Conservation and Management Act. The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act set forth a number of new mandates for the NMFS, regional fishery management councils, and federal action agencies to identify and protect important marine and anadromous (migrating) fish habitat, with the goal of maintaining sustainable fisheries. Fisheries management councils, with assistance from NMFS, are required to delineate EFH in FMPs or FMP amendments for all managed species. Federal action agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding potential adverse effects of their actions on EFH and respond in writing to agency recommendations. In addition, NMFS is required to comment on any state agency activities that would impact EFH. Although the concept of EFH is similar to that of Critical Habitat under the ESA, measures recommended to protect EFH by NMFS or a council are advisory, not mandatory. An effective EFH consultation process ensures that federal actions serve the Magnuson-Stevens Fishery Conservation and Management Act resource management goals. The POLB Inner and Outer Harbors are in an area designated as EFH for two FMPs: the Coastal Pelagics FMP; and the Pacific Groundfish FMP. Therefore, consultation would have to occur with NMFS.

Migratory Bird Treaty Act of 1918. This Act (16 USC 703-712; 50 CFR 10), as amended, prohibits taking of migratory birds, which includes possession, pursuing, hunting, capturing, or killing migratory bird species, unless specifically authorized by a regulation implemented by the Secretary of the Interior, such as designated seasonal hunting. The Act also applies to removal of nests occupied by migratory birds during the breeding season. This regulation can constrain construction activities that have the potential to affect nesting birds, either through vegetation removal and land clearing, or through other construction- or operation-related disturbance. Under certain circumstances, a depredation permit can be issued to allow limited and specified take of migratory birds.

Marine Mammal Protection Act. The MMPA of 1972 sets up a management regime to reduce marine mammal mortalities and injuries in their interactions with fisheries (e.g., gear entanglement) and regulates scientific research in the wild. NMFS and the USFWS administer the MMPA. NMFS is responsible for the management and conservation of whales and dolphins (cetaceans) and pinnipeds other than the walrus. All of the marine mammal species found in and near Long Beach Harbor are under the jurisdiction of NMFS.

California Endangered Species Act. This Act (California Fish and Game Code Section 2050 *et seq.*) provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFG, and prohibits the taking of such species without authorization by CDFG under Section 2081 of the Fish and Game Code. State lead agencies must consult with CDFG during the CEQA process if state-listed threatened or endangered species are present and could be affected by the Project.

For projects that could affect species that are both federally- and state-listed, compliance with the federal ESA would satisfy the state Act if CDFG determines that the federal incidental take authorization is consistent with the state Act under Fish and Game Code Section 2080.1.

Ballast Water Management for Control of Nonindigenous Species Act. PRC Section 71200 *et seq*. (enacted January 1, 2000), and as amended by AB 433 in September 2003 and AB 740 in October 2007, requires ballast water management practices for all vessels, domestic and foreign, carrying ballast water into waters of the state after operating outside the Exclusive Economic Zone (EEZ). Specifically, the regulation prohibits ships from exchanging ballast water within port waters, and requires that exchange occur outside the EEZ in deep, open ocean waters. Alternatively, ships may retain water while in port, discharge to an approved reception facility, or implement other similar protective measures. Vessels also are required to report the ballast water management activities to the CSLC. The CSLC sets fees for vessels entering California ports from outside California, has developed a Hull Husbandry Reporting Form to collect information on hull cleaning and vessel ports of call, and has set performance standards for ballast water discharges that will go into effect starting in January 2009. The CSLC also has prepared a report on the efficacy, availability, and environmental impact of current ballast water treatment technologies (December 2007).

The statewide compliance with ballast water reporting was 97 percent for 2003 and over 98 percent for 2004 (Falkner et al. 2005). Of the vessels reporting in 2004, 96 percent indicated that they complied with the mandatory management requirements, either through retaining ballast water on board or by exchanging ballast water prior to discharge. The POLB and POLA collectively received 54 percent of the qualifying vessels for a total of 5,445 in 2004. The Act also requires an analysis of other vectors for release of non-native species from vessels. Rules for vessels originating within the Pacific Coast Region took effect in March 2006.

Executive Order 13112 Invasive Species. This Executive Order (EO), signed in 1999, requires federal agencies to identify actions that may affect the status of invasive species and, to the extent feasible, prevent the introduction of such species. The agencies are also required to control and monitor populations of invasive species, restore native species and habitat conditions in ecosystems that have been invaded, conduct research on prevention of introduction and control of invasive species, and promote public education on those species. Federal agencies shall not fund, authorize, or carry out actions that would cause the introduction or spread of invasive species. The EO established an Invasive Species Council to prepare a National Invasive Species Management Plan.

3.4.2 Impacts and Mitigation Measures

3.4.2.1 Significance Criteria

Pursuant to the POLB Environmental Protocol (POLB 2006) and consistent with CEQA Guidelines *Appendix G* Environmental Checklist, impacts to marine biota and habitats would be considered significant if the Project would:

BIO-1: Substantially affect any rare, threatened, or endangered species or their habitat;

BIO-2: Interfere with migration or movement of fish or wildlife;

BIO-3: Result in a substantial loss or alteration of marine habitat;

BIO-4: Substantially affect a natural habitat or plant community, including wetlands; or

BIO-5: Substantially disrupt local biological communities.

The determination of substantial effect is based on professional judgment and takes into account available recent data and the magnitude and duration of the impact and the commercial, recreational, scientific, or regulatory status of the affected resource.

3.4.2.2 Methodology

The impact analysis evaluates how Project activities during construction and operations would affect biological resources by using the information from the setting, literature information about the responses of biota to disturbances and pollutants, and preparer expertise and judgment in evaluating existing information regarding species and habitats present and how Project components interact with the environment.

3.4.2.3 Alternative 1 – 345-Acre Alternative (the Project)

Construction Impacts

Impact BIO-1.1: Construction activities would not substantially affect any rare, threatened, or endangered species or their habitat.

Dredging and filling as well as backland improvements and wharf construction/ reconstruction activities would be unlikely to affect any listed, candidate, sensitive, or special concern species due to temporary increases in noise, vibration, turbidity, or the potential for displacement of individuals from the work area. No critical habitat for any federally-listed species is present. The Project area is not considered an important area for least tern or brown pelican foraging. The Project area also does not provide any other important habitat values for the least tern and only limited perching/resting sites for the brown pelican. Dredging/filling activities and the resultant temporary turbidity would affect few if any individuals of these species, and other foraging areas are available nearby if construction disturbances cause them to temporarily avoid the work areas. Foraging in the Project area could also continue with no adverse effects to either species compared to baseline conditions.

The peregrine falcon feeds on other birds and would not be affected by Project activities because no prey would be lost and only a small amount of potential foraging area would be temporarily affected. No known peregrine falcon nesting areas would be affected. The backland areas are not used by sensitive species for resting, foraging, or breeding. Therefore, none of these species would be affected by Project construction activities.

No habitat for bat roosting or breeding would be lost as a result of Project construction because no bridges or other suitable structures would be removed. Bats using the Gerald Desmond Bridge, or other nearby bridges, are adapted to the noise of this industrial area, and backlands construction and operations noise would not disturb bats using the bridges. Bats forage at night over a variety of habitats, and Project activities (construction and operations) would not interfere with that foraging.

The water surface and on-shore facilities in the Project area are generally not used by the black skimmer for resting or foraging compared to other areas in the harbor. Any individuals of this species would be able to use other areas within Middle Harbor or the harbor complex if construction activities occurred when they were present and if the disturbances caused them to temporarily avoid the work area. Thus, this species would not be adversely affected by construction activities.

Sound pressure waves in the water caused by pile driving, particularly the 11 steel dolphin piles (Section 1.6.3.1), could affect marine mammals swimming in the Project area, although the species and abundance is limited. Sea lions and possibly harbor seals could be present in low numbers in the Middle Harbor area (Section 3.4.1.2). The impulse pressures from driving 24-inch octagonal concrete piles would be below the guideline of 190 dB in reference to (re) 1 µPa for California sea lions and harbor seals based on measured sound levels at five projects in the San Francisco Bay area (Illingworth & Rodkin 2007). For the 11 steel piles to be driven, the impulse pressure would be slightly above that guideline at 33 feet and would be less at greater distances based on measurements during steel pile driving in San Francisco Bay. Concrete pile driving would occur over 226 days (divided among three stages) in Phase 1 and 106 days in Phase 2 with approximately eight piles driven per day. Each pile is estimated to take 30 minutes to drive. Observations during pile driving for the San Francisco-Oakland Bay Bridge East Span seismic safety project showed sea lions swam rapidly out of the area when piles were being driven (Caltrans

2001). Thus, sea lions would be expected to avoid areas that could affect them. Harbor seals are unlikely to be present as few have been observed in the Project area. Any seals or sea lions present during construction would likely avoid the disturbance areas and, thus, would not be injured. Construction activities would not interfere with marine mammal foraging because the disturbances would be in localized areas and large foraging areas would remain available to them. Thus, Project construction would have minor, if any, short-term effects on a few individual sea lions and harbor seals. No other protected or sensitive marine species normally occur in the Project area.

The Project includes an environmental control that would require the construction contractor to use sound abatement techniques to reduce both noise and vibrations from pile driving activities (Section 1.7.3). Sound abatement techniques would include, but are not limited to, vibration or hydraulic insertion techniques, drilled or augured holes for cast-in-place piles, bubble curtain technology, and sound aprons where feasible. At the initiation of each pile driving event, and after breaks of more than 15 minutes the pile driving would also employ a “soft-start” in which the hammer would be operated at less than full capacity (i.e., approximately 40–60 percent energy levels) with no less than a one-minute interval between each strike for a five-minute period. Additionally, a qualified biological monitor would note (surface scan only) whether marine mammals are present within 100 meters of the pile driving and, if any are observed, temporarily halt pile driving until the observed mammals move beyond this distance. Therefore, implementation of sound abatement techniques and marine mammal monitoring would minimize impacts to pinnipeds during pile driving activities. Some behavioral pattern changes (i.e., breeding, feeding, or sheltering) would be possible, however, for the few individuals that could be exposed to 160 dB re 1 μPa or more during the short duration of the pile driving.

Although vessel transport of construction materials to the Project site from outside the POLB would occur at intervals over approximately 10 years, the potential for a Project-related vessel collision with a blue whale or gray whale, or a sea turtle, in offshore waters would be unlikely considering the small number of these vessels relative to existing vessel traffic in this area. In addition, few blue whales and gray whales are known to be struck by existing traffic within this area. Furthermore, much of the Project-related vessel traffic would include barges carrying materials, such as rock, that travel at less than 10 knots.

The potential for a Project-related support vessel collision with a blue whale or gray whale, or a sea turtle, while in transit within the Long Beach Breakwater and Outer Harbor would be unlikely due to the infrequent presence of these animals. The normal swimming speed of blue whales is 22 km/hr, which is approximately 10 knots; however, blue whales can swim up to 48 km/hr when alarmed (Wilson and Ruff 1999). Therefore, it is very unlikely that Project-related vessels traveling at 12 knots would increase the potential for whale strikes.

The USACE has determined that the Project would not adversely affect the California least tern or California brown pelican and would have no effect on the western snowy plover, sea turtles, and blue whale.

<u>CEQA Impact Determination</u>

As described above, construction activities would result in no loss of individuals or habitat for rare, threatened, or endangered species and sound pressure waves from construction activities in the water would not injure marine mammals. Project-related vessel strikes of blue whales, gray whales, and sea turtles would be unlikely to occur. Impacts would, therefore, be less than significant under CEQA.

Mitigation Measures

As impacts on biota and habitats would be less than significant, no mitigation is required. However, the existing Vessel Speed Reduction Program (VSRP) would further reduce the risk of injury to whales from vessel strikes.

Significance of Impacts after Mitigation

Impacts on biota and habitats would be less than significant.

<u>NEPA Impact Determination</u>

In-water construction activities would result in no loss of individuals or habitat for rare, threatened, or endangered species, and sound pressure waves from construction activities in the water would not injure marine mammals. Project-related vessel strikes of blue whales, gray whales, and sea turtles would be unlikely to occur. The Project backland improvements are part of the NEPA Baseline and thus would have no impacts.

Therefore, less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on biota and habitats would be less than significant, no mitigation is required. However, the existing VSRP would further reduce the risk of injury to whales from vessel strikes.

Significance of Impacts after Mitigation

Impacts on biota and habitats would be less than significant.

Impact BIO-2.1: Construction activities would not interfere with wildlife movement/ migration corridors.

No known migration corridors for terrestrial or aquatic wildlife species are present in the harbor. The California least tern is a migratory bird species that nests on Pier 400, and construction of Project facilities in the Long Beach Middle Harbor region and on the adjacent backlands would not interfere with the aerial migration of this species. Movement to and from foraging areas in the harbor also would not be affected by any of the Project activities. The western snowy plover is also a migratory species, and a few migrating individuals have been observed at the least tern nesting site in recent years. Breeding individuals of the California brown pelican move to breeding sites in Mexico and offshore islands for part of the year. Construction activities in Middle Harbor and on the adjacent lands would not block or interfere with migration or movement of either species because the work would be in a small portion of the harbor area where the birds could occur and the birds could easily fly around or over the work. Vessel transport of construction materials to the Project site from outside the POLB would occur at intervals over approximately 10 years. The Project-related vessels would not interfere with whale or sea turtle migration along the coast of California due to the small number of vessels relative to the total number of vessels entering the Long Beach/Los Angeles Harbor.

<u>CEQA Impact Determination</u>

No wildlife movement or migration corridors would be affected by the Project. Therefore, no impacts would occur under CEQA.

Mitigation Measures

As impacts on biota and habitats would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on biota and habitats would not occur.

<u>NEPA Impact Determination</u>

Dredging, filling, and wharf work would not affect any wildlife movement or migration corridors. Therefore, no impacts would occur under NEPA.

Mitigation Measures

As impacts on biota and habitats would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on biota and habitats would not occur.

Impact BIO-3.1: Construction would result in a substantial loss or alteration of marine habitat through filling (in Slip 1, for the Berth E24 extension, and in a portion of the East Basin) and excavation (widening Slip 1 and at Berth F201) for a net loss of 54.6 acres.

Placement of fill would cause a loss of marine habitat, including water surface, water column, soft bottom, and hard substrate. Based on preliminary design, approximately 65.3 acres of marine habitat would be permanently lost (Table 3.4-3) due to fill placement in Slip 1 and the East Basin. Widening Slip 3 would create approximately 6.3 acres of marine habitat, and excavation at Berth F201 would create about 4.4 acres of marine habitat. The net loss of marine habitat would be an estimated 54.6 acres (Table 3.4-3). The exact amount of habitat gain and loss would be calculated by the Port and the agencies who are signatories to the Inter-Agency Bolsa Chica MOA (refer to the following discussion under Mitigation Measures) after completion of the Project, on the basis of the "as-built" surveys. Those final figures would not be expected to vary from the above estimates by more than a few acres, so that the final loss of habitat could range from 50 to 60 acres. For this analysis, however, the estimates from the preliminary design are used.

The rocky dike constructed along Pier D and at Berths E23-E26 would create approximately 14.4 acres of new hard substrate that would partially offset the 16.1-acre loss from the fill placement in Slip 1 and East Basin for a net loss of 1.7 acres. Hard substrate habitat in the form of pilings associated with the wharves in Slip 1 (1,746 piles and fenders), in Slip 3 (805 piles and fenders), and along Pier F (1,071 piles and fenders) in East Basin

Table 3.4-3. Middle Harbor Project Habitat Impact Summary (in acres)

Construction Phase	Location	Marine Habitat Loss/Gain[1]	Inner Harbor	Outer Harbor
1	Slip 1 fill	-25.6	-25.6	--
2	East Basin fill	-34.3	-10.0	-24.3
1	Pier E Extension	-5.4	--	-5.4
Total Habitat Loss		65.3	-35.6	-29.7
1	Slip 3 widening	+6.3	+6.3	--
2	Berth F201 excavation	+4.4	--	+4.4
Total Habitat Created		+10.7	+6.3	+4.4
Net Habitat Loss		-54.6	-29.3	-25.3

Notes:
1. Water column, soft bottom, and hard substrate.
   Acreages are approximate. + = gain and - = loss.

would also be lost, but 2,707 new pilings would be installed for Berths E23-E26 with over half in the water. The vertical bulkhead in the water along Pier D and Pier E in Slip 3 and along Pier F in Slip 1 would also be removed or covered with fill (total of 5,897 linear feet), and 410 linear feet of bulkhead would be constructed in the water along Pier E. The net effect of these changes would be a loss of hard substrate habitat.

CEQA Impact Determination

The permanent net loss of 54.6 acres of marine habitat in Long Beach Harbor is considered significant under CEQA. The small amount of hard substrate habitat lost would be less than significant under CEQA because the loss of this man-made habitat would not disrupt local biological communities as covered by **Impact BIO-5.1**.

Mitigation Measures

Unavoidable losses of marine habitat in the Long Beach/Los Angeles Harbor complex are mitigated by the use of habitat credits from mitigation banks created by the two ports. This policy was developed by the USACE, USFWS, NMFS, and CDFG in consultation with the Ports and has been applied to port development projects for the past 20 years. The goal of the mitigation policy is "no net loss of in-kind habitat value," where in-kind refers to marine tidal water of value to fish and birds. Given the infeasibility of undertaking any substantial onsite mitigation and the public interest mandate of accommodating maritime cargo conferred upon the Port by the CCA, offsite mitigation is allowed between Pt. Conception and the Mexican border (area of ecological continuity). Implementation of mitigation measures shall occur prior to or concurrent with Project impact. The preferred mitigation is the restoration of coastal embayment habitat (i.e., tidal wetlands).

Accordingly, the two ports have undertaken several wetlands restoration projects (e.g., Anaheim Bay and Batiquitos Lagoon) that generated habitat mitigation credits. The most recent credits have been generated by funding a multi-agency project to restore tidal wetland habitats in the Bolsa Chica lowlands in Orange County. The credits were vested via the Inter-Agency Bola Chica MOA that was negotiated in 1996 and amended in 2003 to provide in-kind credits for Port fills. The parties to the MOA include NMFS, USFWS, CDFG, USACE, California Coastal Conservancy, Ports of Los Angeles and Long Beach, EPA, California Resources Agency, and CSLC; thus the MOA incorporates all applicable federal and state agencies and their associated mitigation policies.

Recognizing that the credits would be applied to a harbor complex in which habitat quality varies, the Inter-Agency Bolsa Chica MOA also defined how those credits were to be used. Under the MOA, areas of the harbor designated as "Inner Harbor" for habitat mitigation purposes require the application of 0.5 credit to offset each acre of lost habitat, whereas areas designated as "Outer Harbor" require the application of 1.0 credit per acre of loss. The delineation of Inner and Outer Harbor is contained in Exhibit C of the MOA (Figure 3.4-1).

For the proposed Project, habitat credits from restoration of Bolsa Chica would be used to offset the 54.6-acre loss of marine habitat in accordance with the MOA. The entire Slip 1 fill (25.6 acres) and 10.0 acres of the East Basin 34.3-acre fill would constitute Inner Harbor habitat (Table 3.4-3), while the remaining 24.3 acres of East Basin Fill and the 5.4-acre Pier E extension fill would constitute Outer Harbor habitat. Widening Slip 3 would result in the creation of 6.3 acres of Inner Harbor habitat leaving a net loss of 29.3 acres of Inner Harbor habitat. Excavation at Berth F201 would result in the creation of 4.4 acres of Outer Harbor habitat, leaving a net loss of 25.3 acres of Outer Harbor habitat.

To mitigate these losses, Bolsa Chica credits would need to be applied as follows: 14.7 credits to mitigate 29.3 acres of Inner Harbor fill at a ratio of 0.5 credit:1 acre of fill and 25.3 credits to mitigate the Outer Harbor fill at a ratio of 1:1, for a total of 40.0 credits. As noted above, the completed Project could result in the use of more or fewer credits, but the difference would only be four or five credits at most, meaning that actual mitigation credits needed would be between 35 and 45. Currently, the Port has approximately 270 Bolsa Chica credits remaining in its account (Table 3.4-4). Therefore, sufficient credits remain in the Port's account to mitigate the marine habitat lost due to construction of the Project even if the as-built survey results show the need for as many as 45 credits.

Table 3.4-4. Available Bolsa Chica Mitigation Credits (through ~2007)

Project	Credits[1]	Debits[2]	Balance
Projects Prior to 1997	195.2	194.5	0.7
Release of Escrow (1997)	14.0		14.7
Bolsa Chica Initial (1997)	227.0		241.7
Bolsa Chica Subsequent (1997)	40.0		281.7
Slip 2 Pier E 29-acre Fill		14.5	267.2
Pier S/T Mole 22-acre Fill		22.0	245,2
Pier G/J Phase I 10.1-acre Fill		10.1	235.1
Pier T Navy Mole Fill		2.4	232.7
Bolsa Chica 3rh Agreement (2005)	38.0		270.7
Pier G/J Phase 2 39.8-acre fill		19.9[3]	250.8
Middle Harbor 54.6-acre fill		40.0	210.8
Pier S Wharf (dike cut)	9.2		220.0

Notes:

1. Credits are estimated and may change based on as-built surveys.
2. As of 1997, pursuant to Exhibit C of the Bolsa Chica Interagency MOA, mitigation credits utilized for harbor fills will be deducted at the ratio of 1.0 credit:1.0 acre of fill in the outer harbor, and at the rate of 0.5 credit:1.0 acre of fill in the inner harbor.
3. Mitigated as Inner Harbor per Bolsa Chica MOA.

BIO-3: The Port would apply approximately 40 credits available in the Bolsa Chica bank to compensate for loss of fish and wildlife habitat due to construction of fill in Slip 1 and East Basin. Implementation of this mitigation measure would occur upon completion of construction of the Project, although permits to begin construction would normally not be issued until the permitting agencies (USACE and POLB for this Project) have received assurance that sufficient mitigation is or will be available. This document constitutes that assurance.

Significance of Impacts after Mitigation

This measure would fully mitigate the significant loss of marine habitat for aquatic species by replacing the lost habitat. Therefore, impacts to biota and habitats would be less than significant.

<u>NEPA Impact Determination</u>

The federal portion of the Project would include the same habitat loss described above under the CEQA impact determination for a net loss of 29.3 acres of Inner Harbor habitat and 25.3 acres of Outer Harbor habitat (Table 3.4-3). This impact would be significant under NEPA.

Mitigation Measures

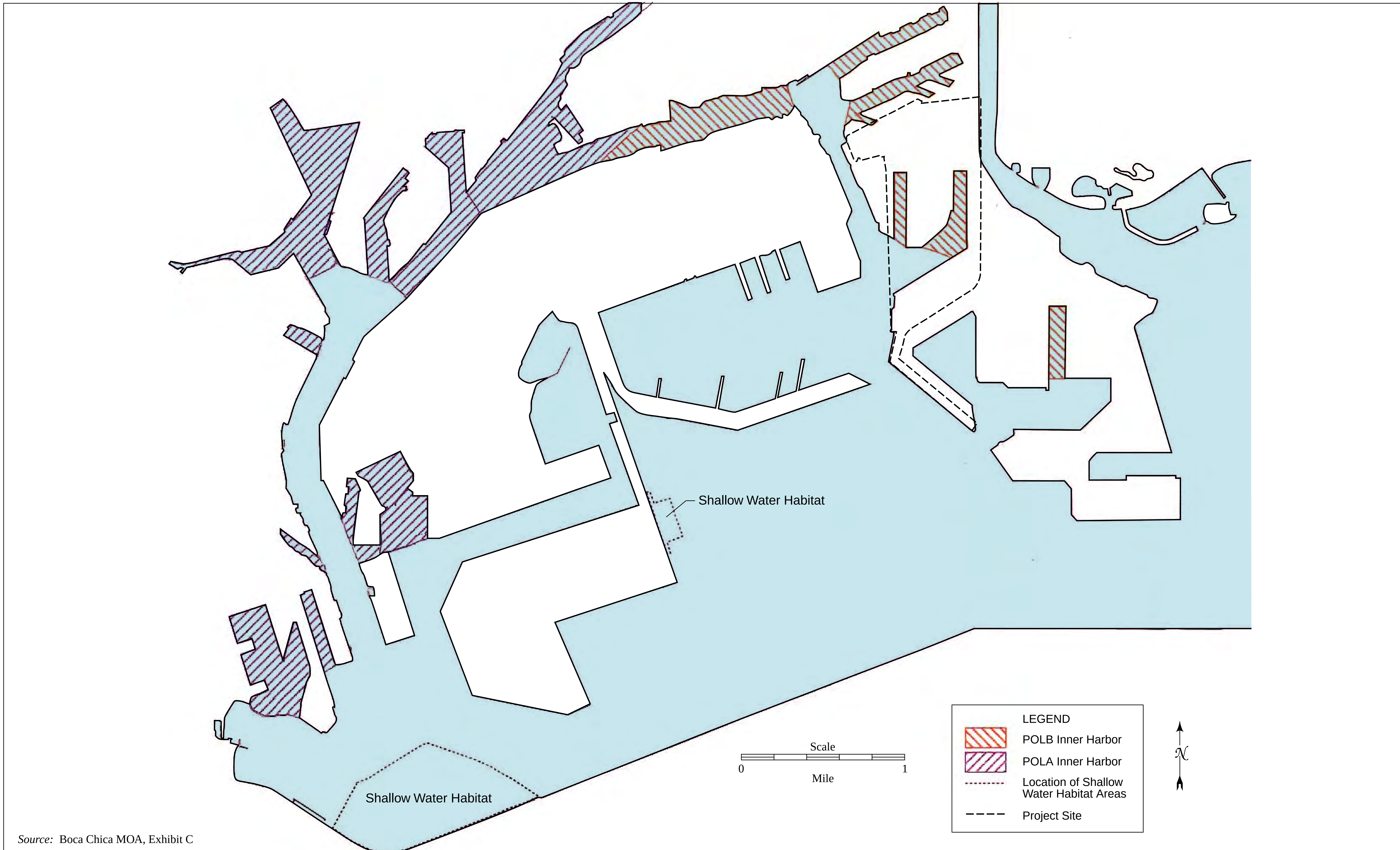
Mitigation Measure BIO-3 would apply to this impact.

Significance of Impacts after Mitigation

Mitigation Measure BIO-3 would fully mitigate the loss of marine habitat for aquatic species by replacing the lost habitat. Impacts on biota and habitats would, therefore, be less than significant.

Impact BIO-4.1: Construction activities would substantially affect a natural habitat or plant community.

The Project could have effects on FMP species that are rare or uncommon, such as California skate, big skate, California scorpionfish, and black rockfish (MEC Analytical Systems, Inc. 2002), although few if any individuals would likely be in the disturbance area. The net loss of marine habitat due to placement of fill and excavation (54.6 acres), however, would result in a substantial loss of habitat for the FMP species that use Middle Harbor, including water column and benthic habitats. Both habitats provide food sources for FMP species occurring in the Project region. Dredging, pile removal, and wharf construction/reconstruction at Berths E23-E27 along with excavation at Berths D29-D31 and F201 also could affect FMP species through habitat disturbance; turbidity and resuspension of contaminants from sediments; and vibration from pile and sheetpile driving and stone column installation. These effects would be temporary and would occur at intervals throughout the construction period, with a return to baseline conditions following construction. Therefore, no permanent loss of habitat would occur from the wharf work, and few, if any, individual fish would be lost because most individuals could avoid the work area.



Source: Boca Chica MOA, Exhibit C

Figure 3.4-1. Inner and Outer Harbor Designations

Construction activities on land would have no direct effects on EFH, which is located in the water. Runoff of sediments from such construction, however, could enter harbor waters. As discussed in Section 3.3, Hydrology and Water Quality, implementation of sediment control measures would avoid or minimize such runoff.

No kelp, eelgrass beds, salt marsh, or freshwater wetlands are present in the Project area, and those in other parts of the harbor would not be affected by construction activities in the Middle Harbor Project area due to their distance from Middle Harbor and the localized effects of sediment suspended during dredging and filling (Section 3.3). No designated SEAs, including the least tern nesting site on Pier 400, would be affected by the Project.

CEQA Impact Determination

Filling of Slip 1 and part of East Basin would result in a permanent loss of EFH in Middle Harbor, a significant impact under CEQA. Dredging and wharf construction activities would cause temporary disturbances to habitat for FMP species that would be less than significant. Excavation to widen Slip 3 and at Berth F201 would increase the amount of EFH, a benefit. Construction activities in the backlands would have no direct effects on EFH or other natural habitats. Indirect effects through runoff of sediments during storm events would be less than significant because such runoff would be controlled as described for water quality in Section 3.3, Hydrology and Water Quality.

The Project would have no impacts on kelp, eelgrass beds, salt marsh, or freshwater wetlands as none of these habitats are present in the Project area.

Mitigation Measures

Mitigation Measure BIO-3 would apply to this impact. Mitigation of the fill impacts would be by the use of approximately 40 existing mitigation credits. This mitigation measure would fully offset Project impacts to sustainable fisheries. As indirect effects associated with runoff of sediments during storm events would be less than significant, no mitigation is required for sediment runoff impacts.

Significance of Impacts after Mitigation

The mitigation credits would compensate for the loss of EFH as a result of the Project, leaving no residual impact. Impacts of sediment runoff on EFH would be less than significant.

NEPA Impact Determination

Construction activities in the water would result in a permanent loss of EFH in Middle Harbor, as previously described, which would be a significant impact under NEPA. Project construction would have no impacts on kelp, eelgrass beds, salt marsh, or freshwater wetlands as described for CEQA.

Mitigation Measures

Mitigation Measure BIO-3 would apply to this impact. Mitigation of the fill impacts would be by use of existing mitigation credits. This mitigation measure would fully offset Project impacts to sustainable fisheries.

Significance of Impacts after Mitigation

The mitigation credits would compensate for the loss of EFH as a result of the Project.

Impact BIO-5.1: Dredging, filling, and wharf construction activities would not substantially disrupt local biological communities.

Dredging for the proposed wharf upgrades and to deepen Slip 3 would temporarily impact approximately 21.1 acres of soft bottom habitat in Phase 1. Reconstruction of Berths E24-E26 would also remove and replace the shoreline riprap under the wharves. Excavation to widen Slip 3 and at Berth F201 would remove existing riprap, and new riprap would be installed on the new shoreline. About 0.3 acre would be dredged to key-in the dike for the East Basin fill in Phase 2. Benthic invertebrates living in and on the sediments to be dredged in Slip 3 would be lost as would those on the riprap removed. At a biomass of 15.5 g/m^2 in soft bottom, approximately 1.3 metric tons of invertebrates living in the sediments would be temporarily lost. The habitat would be made permanently deeper by the dredging, but the sediments would be recolonized by invertebrates, especially polychaetes, with the process starting shortly (hours to days) after the dredging stops in each location. A community similar to that currently present would be expected to develop within five years based on surveys in 1987 of areas dredged in 1982 (MEC Analytical Systems, Inc. 1988). This would represent a temporary loss in bottom community productivity and diversity and alteration of food available for fish and other marine organisms that feed on benthos in a small proportion of the Long Beach Harbor.

Excavation and wharf reconstruction would result in a loss of approximately 186.7 metric tons of invertebrates on rocky dikes that would be replaced by colonization of the new dikes. The replacement of soft bottom with rocky dike would permanently remove 0.09 metric ton of invertebrates, but the rocky dike would be expected to be colonized by a diverse assemblage of marine organisms at a higher biomass (1,000 to over 13,000 g/m^2; MEC Analytical Systems, Inc. 2002) than that found in the soft-bottom sediments (15.5 g/m^2; MEC Analytical Systems, Inc. 2002) based on observed biomass of organisms in/on those habitats.

Impacts of constructing the fill in Slip 1, at the end of Berth E24, and in East Basin to special status species are addressed under **Impact BIO-1.1**.

Benthic organisms in a narrow strip of soft bottom areas adjacent to the dredging and on the riprap, piles, and bulkheads along the berths would be subjected to temporary impacts from turbidity and sediment deposition generated by dredging. Lethal and sublethal effects that could occur include direct mortality, reduction in development and growth, reduced feeding, depressed filtration rate, and increased mucous secretion. Benthic organisms exposed to turbidity could also be buried by sediments settling on them. However, impacts of turbidity and sediment deposition would be temporary with rapid recovery of the benthic communities.

Planktonic organisms would be temporarily affected by turbidity within the water column. Turbidity can impact plankton populations by lowering the light available for phytoplankton photosynthesis and by clogging the filter feeding mechanisms of zooplankton. Impacts to plankton are expected to be short term and limited to the immediate vicinity of the dredging. Planktonic organisms have a naturally-occurring high mortality rate and their reproductive rates are correspondingly high, thereby allowing for rapid recovery from localized impacts. Elutriate tests on the sediments similar to those to be dredged indicate that significant biological impacts are not expected from resuspension of sediments containing contaminants or mobilization of the contaminants into the water column (Section 3.3). In addition, dilution by tidal waters moving into and out of the harbor would rapidly reduce concentrations of contaminants to levels that would not adversely affect marine organisms.

Removal of the top layer of sediment in Slip 3 would remove any accumulated contaminants, thereby decreasing the potential for bioaccumulation of contaminants in aquatic organisms.

Fish in the water column and in or near the bottom would be temporarily disturbed by the dredging and filling activities as a result of turbidity, noise, displacement, and vibration. Most fish would leave the immediate area of the dredging, although some may stay to feed on invertebrates released from the sediments. No mortality of fish has been observed in the Outer Harbor as a result of dredging activities associated with the Deep Draft Navigation Improvements Project (Pier 400) (USACE and LAHD 1992). After dredging is complete, reduced numbers of invertebrates (until recolonization is complete) would reduce the food supply for some species of fish. However, those effects would be short term and localized.

Demolition and reconstruction of the Project wharves would replace approximately 3,050 concrete piles and 764 timber fenders with approximately 2,707 new concrete piles. Eight 36-inch diameter steel piles would be installed for a permanent mooring dolphin. The new pilings, installed to support these wharves and the permanent mooring dolphin, would add hard substrate habitat in East Basin. In addition, approximately 5,897 linear feet of bulkhead would be removed while 410 linear feet would be installed, resulting in a net loss of bulkhead hard substrate in the water. The density (biomass) of organisms on concrete piles is approximately 121 g/m^2. The three 36-inch diameter steel piles installed and then removed for the temporary mooring dolphin that would be used during construction would provide additional, short-term habitat.

Introduction to or spread of invasive species such as the alga *Caulerpa* in Long Beach Harbor is a concern. Because this species would most likely be introduced from disposal of aquarium plants and water, and is spread by fragmentation rather than from ship hulls or ballast water, the risk of introduction is associated with movement of plant fragments from infected to uninfected areas by activities such as dredging and/or anchoring. Preconstruction surveys for *Caulerpa taxifolia* (Surveillance Level for *Caulerpa*-free systems) would be conducted as part of a pre-dredging program, consistent with the NMFS/CDFG protocol (*Caulerpa* Control Protocol; Version 4, February 25, 2008). These monitoring surveys would help to avoid or minimize potential effects if *Caulerpa* were detected. This would reduce the potential for spread of this invasive species through Project disturbances of the bottom.

As described in Section 3.3, construction of the new landfill is expected to have minor effects on water quality and circulation. Consequently, altered water quality would not adversely affect aquatic biota.

Construction of wharf and container terminal facilities on the new landfill as well as construction on previously developed areas could affect biological resources through: (1) noise and vibration; and (2) runoff of pollutants. Turbidity, noise, and vibration (primarily from pile driving and stone column installation) would likely cause fish and birds to leave the immediate construction area, at least temporarily. Impacts on fish and bird populations, however, are expected to be short term and localized due to the small area affected and the short duration of the disturbance. Backland construction activities would have minimal effect on terrestrial biota because the species present are non-native and/or adapted to use of developed sites. Disturbances would be temporary, and the animals present could move to other nearby areas for the duration of the disturbance.

Runoff of pollutants from backland construction activities would be minimized through use of BMPs (Section 3.3), and the low concentrations that could enter harbor waters would not adversely affect marine organisms. Accidents on land could result in runoff of pollutants, but levels that could adversely affect aquatic biota near the point of discharge to the harbor are unlikely due to rapid cleanup and implementation of runoff control measures as described in **Impact WQ-1.2** (Section 3.3, Hydrology and Water Quality).

Accidental spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging, excavation, and disposal of the material are unlikely to occur during the Project (Section 3.3) or affect marine biota in the harbor. Any such spills would be small and cleaned up immediately, causing no adverse biological effects. A larger spill that could have locally significant impacts on biological resources is not expected to occur under reasonable worst-case conditions.

<u>CEQA Impact Determination</u>

Construction activities in the waters of Middle Harbor, particularly dredging of soft sediments and removal/installation of new riprap, bulkheads, and pilings, would result in temporary disturbances to benthic habitats. Colonization by invertebrates would occur quickly on these new substrates, with ecological succession until a dynamic equilibrium is established similar to harbor areas that have not been disturbed in more than five years. The net loss of hard substrate habitat would, however, have less than significant impacts because local benthic, fish, and plankton communities would not be substantially disrupted by the small change in the amount of hard substrate habitat present at the Project site relative to that in the harbor.

Short duration turbidity in the water would not exceed water quality standards, and impacts to aquatic biota would be less than significant due to the short duration and small area likely to be affected. Pre-construction surveys would ensure that *Caulerpa* would not be spread as a result of Project construction; therefore, no impacts would occur.

Construction activities on the existing backlands and new fill would have less than significant impacts on terrestrial biota for the reasons previously described. Runoff of pollutants from backland construction activities would have localized, short-term, and less than significant effects on marine organisms in the vicinity of drain outlets due to implementation of runoff control measures that are part of the Project. Accidental spills from equipment during dredging are unlikely to occur, and any small spills would be cleaned up immediately, resulting in only localized, less than significant impacts.

Mitigation Measures

As impacts on biota and habitats would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on habitats and biota would be less than significant.

<u>NEPA Impact Determination</u>

Construction activities in the waters of Middle Harbor, particularly dredging of soft sediments and removal/installation of new riprap, bulkheads, and pilings, would result in temporary disturbances to benthic habitats. Colonization by invertebrates would occur quickly on these new substrates, with ecological succession until a dynamic equilibrium is established similar to harbor areas that have not been disturbed in more than five years. The net loss of hard substrate habitat would, however, have less than significant impacts because local benthic, fish, and plankton communities would not be substantially disrupted by the small change in amount of hard substrate habitat present at the

Project site relative to that in the harbor. The short duration of turbidity in the work area would not exceed water quality standards (Section 3.3), and no significant impacts to aquatic biota would occur due to the short duration and small area likely to be affected. Pre-construction surveys would ensure that *Caulerpa* would not be spread as a result of Project construction; therefore, no impacts would occur. Accidental spills from equipment during dredging are unlikely to occur, and any small spills would be cleaned up immediately resulting in only localized, less than significant impacts.

Mitigation Measures

As impacts on biota and habitats would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on habitats and biota would be less than significant.

Operational Impacts

Impact BIO-1.2: Operations would not substantially affect any endangered, threatened, or rare species or their habitat.

Operation of new and upgraded terminal facilities in Middle Harbor would not adversely affect any of the federally- or state-listed, or special concern bird species listed in Table 3.4-1. Those species that currently use the area for foraging or resting could continue to do so because the Project would not appreciably change the industrial activities or cause a loss of habitat for those species.

An estimated 179 additional vessel calls per year above the CEQA Baseline of 185 to Middle Harbor would result from the Project (Section 3.6, Vessel Transportation), representing a small number compared to the total using the harbor (3,380 per year in Long Beach Harbor). Underwater sound from these vessels and the tugboats used to maneuver them to the berth would add to the existing vessel traffic noise in the harbor. However, this would not result in a significant change in overall noise because it would take an approximate doubling in the total number of vessels (noise sources) in the harbor area to increase the overall underwater sound level by even three dBA (FHWA 1978).

Further, adding one vessel transit in and out every two days is not expected to adversely affect marine mammals in the Outer Harbor. This is because the transits would be short and infrequent, few individuals would be affected (only small numbers are present in the harbor), sea lions and harbor seals would be expected to avoid sound levels that could cause damage to their hearing, and overall underwater noise levels would not be significantly increased. Vessels approaching Queens Gate would pass through nearshore waters, and the sound from their engines and drive systems could affect marine mammals that happen to be nearby. However, few individuals would be affected (animals are generally sparsely distributed), the animals would likely move away from the sound as it increases in intensity from the approaching vessel, and exposure would be of short duration, which would reduce the potential for any effects. Vessel strikes of blue whales and gray whales would be unlikely for the reasons described under **Impact BIO-1.1**.

Due to their low frequency of occurrence in the harbor and Precautionary Area, and the small number of Project vessels relative to the annual POLB vessel calls, a Project-related vessel collision with a sea turtle would be unlikely.

The USACE has determined that the Project would be likely to adversely affect the California least tern or California brown pelican and would have no effect on the western snowy plover, sea turtles, and blue whale.

CEQA Impact Determination

Operational activities would result in no loss of individuals or habitat for rare, threatened, or endangered species, and underwater sound from Project-related vessels would affect few, if any, marine mammals. Vessel collisions with whales or sea turtles in offshore waters are unlikely. Therefore, less than significant impacts would occur under CEQA.

Mitigation Measures

As impacts on special status species would be less than significant, no mitigation is required. However, the existing VSRP would further reduce the risk of injury to whales from vessel strikes.

Significance of Impacts after Mitigation

Impacts on special status species would be less than significant.

NEPA Impact Determination

Operation of facilities on the new fill and in the water would result in no loss of individuals or habitat for rare, threatened, or endangered species, and underwater sound from Project-related vessels would affect few if any marine mammals. Vessel collisions with whales or sea turtles in offshore waters are unlikely. Therefore, less than significant impacts would occur under NEPA.

Mitigation Measures

As impacts on special status species would be less than significant, no mitigation is required. However, the existing VSRP would further reduce the risk of injury to whales from vessel strikes.

Significance of Impacts after Mitigation

Impacts on special status species would be less than significant.

Impact BIO-2.2: Operations activities would not interfere with wildlife movement/migration corridors.

Once construction is complete, migration by bird species that visit or pass through the Project area, as described under **Impact BIO 2.1**, would not be affected by the changes in terminal operations. The new structures would be of similar size, number, and character as the existing structures and, therefore, would not impede their movement. Project-related vessel traffic to and from the harbor would not interfere with marine mammal migrations along the coast. This is because these vessels would represent a small proportion (3.4 percent) of the total Port-related commercial traffic in the area. Additionally, each vessel would have a low probability of encountering migrating marine mammals during transit through coastal waters, due to the generally sparse distribution of these animals.

<u>CEQA Impact Determination</u>

No wildlife movement or migration corridors would be affected by the Project. Therefore, no impacts would occur under CEQA.

Mitigation Measures

As impacts on wildlife movement and migration corridors would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on wildlife movement and migration corridors would not occur.

<u>NEPA Impact Determination</u>

No wildlife movement or migration corridors would be affected by the Project. Therefore, no impacts would occur under NEPA.

Mitigation Measures

As impacts on wildlife movement and migration corridors would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on wildlife movement and migration corridors would not occur.

Impact BIO-3.2: Operation of Project facilities would not substantially reduce or alter marine habitat.

The permanent loss of water column, soft bottom, and rocky dike habitat impacts described for construction (**Impact BIO-3.1**) would continue throughout operations, but **Mitigation Measure BIO-3** would have fully compensated for that loss. There would be no additional loss of marine habitat during Project operations beyond the 54.6 acres lost during Project construction.

<u>CEQA Impact Determination</u>

No marine habitat would be lost or substantially altered as a result of Project operations. Therefore, no impacts would occur under CEQA.

Mitigation Measures

As impacts on marine habitat would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on marine habitat would not occur.

<u>NEPA Impact Determination</u>

No marine habitat would be lost or substantially altered as a result of Project operations. Therefore, no impacts would occur under NEPA.

Mitigation Measures

As impacts on marine habitat would not occur, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on marine habitat would not occur.

Impact BIO-4.2: Operations of Project facilities could substantially affect a natural habitat or plant community.

Operation of Project facilities would have minimal effects on EFH or managed fish species. An increase in vessel traffic of 179 visits over the

CEQA Baseline (185 vessels) due to the Project would not significantly increase overall noise as described for **Impact BIO-1.2**. The additional noise would only occur during vessel transits to and from the berth, and thus would represent short duration events. Therefore, Project-related vessels would add to the number of noise events, but not significantly compared to overall underwater noise levels. The addition of one vessel call every two days would not be expected to adversely affect FMP species present in the harbor because the Project would only add approximately five percent to the existing vessel traffic in the Port. These fish are likely acclimated to the existing noise in the harbor, and a few additional noise events per day, similar to those already occurring, would not cause significant impacts.

Runoff from the new terminal would be essentially the same as under baseline conditions for existing backlands, with a minor addition of pollutants from new fill surfaces due to runoff controls. This runoff would not adversely affect EFH or FMP species.

No kelp, eelgrass beds, salt marsh, or freshwater wetlands would be affected by Project operations because none are present in this part of the harbor.

CEQA Impact Determination

Increased vessel traffic and runoff from the terminal during operations would have less than significant impacts on EFH. Operations would have no impacts on natural communities such as kelp, eelgrass beds, salt marsh, and freshwater wetlands.

Mitigation Measures

As impacts on natural habitats and plant communities would not occur or would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on natural habitats and plant communities would not occur or would be less than significant.

NEPA Impact Determination

Increased vessel traffic and runoff from terminal facilities on the new fills during operations would have less than significant impacts on EFH. Operations would have no impacts on natural communities such as kelp, eelgrass beds, salt marsh, and freshwater wetlands.

Mitigation Measures

As impacts on natural habitats and plant communities would not occur or would be less than significant, no mitigation is required

Significance of Impacts after Mitigation

Impacts on natural habitats and plant communities would not occur or would be less than significant.

Impact BIO-5.2: Operation of Project facilities would not substantially disrupt local biological communities.

The reduced amount of hard substrate (rocky dike, sheet piles, and pilings) and water column would not substantially reduce productivity in the harbor due to the small reduction relative to the total amount of these habitats in the harbor. Vessel traffic at the new/reconstructed wharves would have minimal direct effects on benthic organisms as a result of propeller wash (USACE and LAHD 1992).

Runoff of pollutants to the harbor from the new facilities is expected to add incrementally to pollutant runoff from existing facilities (Section 3.3). Runoff of pollutants would have the potential for localized and less than significant impacts on water quality and would not be expected to adversely affect marine biota.

Capping sediments in Slip 1 and the East Basin (Section 3.3) would reduce the area where benthic invertebrates could come in contact with and potentially accumulate pollutants that could then be passed on to other marine organisms, such as fish, through the food web (bioaccumulation and biomagnification). This would be a long-term beneficial impact.

New lights would be added on the 65 acres of new landfills. Although the new lights would all be of low glare design, the amount of light in the Project area would increase, due to the increased number of lights. Because the lighting would be in industrial areas, the light would not substantially affect important wildlife habitat or the associated species present. No sensitive species are expected to be affected because none are likely to be present in the Project area at night. These species (i.e., the birds listed in Table 3.4-1) are day-active and do not use the Project area for night roosting or resting. The increase in land surface and lighting would not substantially interfere with bat foraging due to the small proportion of the harbor affected and large amount of remaining suitable habitat. Most of the new lights would be located away from the water's edge, except at the new Berth E23, so that marine organisms would not be affected.

The increase in vessel traffic (relative to the CEQA Baseline) would occur within the shipping channel leading into Middle Harbor. As described under **Impact BIO-4.2**, fish in this area are likely acclimated to vessel noise and would not be adversely affected by the minimal additional vessels every two days. The number of vessel calls would decrease relative to the NEPA Baseline.

CEQA Impact Determination

Operations would not substantially disrupt local biological communities as a result of runoff of contaminants, increased vessel traffic, or lighting. Impacts would, therefore, be less than significant under CEQA.

Mitigation Measures

As impacts on local biological communities would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on local biological communities would be less than significant.

NEPA Impact Determination

The analysis presented above for CEQA applies equally to the NEPA impact analysis for runoff from the new fill, and lighting on the new fill. Accordingly, operation of facilities on the new fill and presence of new wharf structures in the water column would not substantially disrupt local biological communities, and less than significant impacts would occur under NEPA. Project-related vessel traffic would not increase, resulting in no impacts under NEPA.

Mitigation Measures

As impacts on local biological communities would be less than significant, no mitigation is required.

Significance of Impacts after Mitigation

Impacts on local biological communities would be less than significant.

Impact BIO-5.3: Project operations could disrupt local biological communities through introduction of non-native species.

The amount of ballast water discharged into East Basin and, thus, the potential for introduction of invasive exotic species (LAHD 1999) could increase since more and larger container ships would use the Port as a result of the Project. Because these vessels would come primarily from outside the EEZ, they would be subject to regulations to minimize the introduction of non-native species in ballast water, such as discharging to approved receivers and not exchanging ballast water within ports. Vessels unloading cargo would need to take on ballast water while those loading cargo would need to discharge ballast water. Most container vessels entering the Port would be unloading cargo and, thus, not discharging ballast water.

Non-native algal species and invertebrates can also be spread via vessel hulls and external machinery (Section 3.4.1.2). Algal species such as *Undaria pinnatifida*, discovered in Long Beach/Los Angeles Harbor in 2000 (MEC Analytical Systems, Inc. 2002), and *Sargassum filicinum* could be transported to the harbor via vessels traveling between ports within the EEZ. The new facilities in the Middle Harbor would result in a small increase (approximately 3.4 percent) in vessel traffic compared to the total number of vessels entering the harbor. Considering this small increment and the ballast water regulations currently in effect, the potential for introduction of additional exotic species via ballast water would be low from vessels entering from or going outside the EEZ. For these reasons, the Project has a low potential to increase the introduction of non-native algal and invertebrate species into the harbor. The potential for introduction or spread of the invasive alga, *Caulerpa taxifolia*, as a result of Project operations is very low because the species is most likely introduced from disposal of aquarium plants and water, and is spread by fragmentation rather than from ship hulls or ballast water (**Impact BIO-5.1**).

CEQA Impact Determination

Operation of the Project facilities has the potential, even though of low probability, to result in the introduction of non-native species into the harbor via ballast water or vessel hulls, thereby substantially disrupting local biological communities. Impacts would, therefore, be significant under CEQA.

Mitigation Measures

Although regulations are currently being developed by the state to address ballast water discharges, no feasible mitigation is currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology. New technologies are being explored, and if methods become available in the future, they would be implemented as appropriate at that time.

Significance of Impacts after Mitigation

Impacts on biota and habitats would be significant.

<u>NEPA Impact Determination</u>

Operation of the Project facilities has the potential to result in the introduction of non-native species into the harbor, but the number of vessel calls would be equal to or less than those for the NEPA Baseline. Therefore, no impacts would occur under NEPA.

Mitigation Measures

As no impacts of invasive species on local biological communities would occur, no mitigation is required.

Significance of Impacts after Mitigation

No impacts on local biological communities would occur.

3.4.2.4 Alternative 2 – 315-Acre Alternative

Alternative 2 includes the same 25.6 acres of fill in Slip 1, 5.4 acres of fill for the Pier E extension, and 6.3 acres of excavation for Slip 3 widening as in the Project. However, no fill would be placed in East Basin, and Berth F201 would not be excavated. Thus, the amount of marine habitat affected by Alternative 2 would be less than for the Project.

Impact BIO-1: Special Status Species

<u>CEQA Impact Determination</u>

As described for the Project in **Impacts BIO-1.1 and BIO-1.2**, construction and operational activities would result in no loss of individuals or habitat for rare, threatened, or endangered species, and sound pressure waves from construction activities and vessel traffic in the water would not injure marine mammals. The reduced in-water work would reduce the potential for impacts, and as for the Project, impacts would be less than significant under CEQA.

<u>NEPA Impact Determination</u>

As described for the Project in **Impacts BIO-1.1 and BIO-1.2**, in-water construction activities would result in no loss of individuals or habitat for rare, threatened, or endangered species, and sound pressure waves in the water during construction and operations would not injure marine mammals. The reduced in-water work would reduce the potential for impacts, and less than significant impacts would occur under NEPA.

Impact BIO-2: Wildlife Movement Corridors

<u>CEQA Impact Determination</u>

As described for the Project in **Impacts BIO-2.1 and BIO-2.2**, no known terrestrial wildlife or aquatic species migration corridors are present in the Project area, and vessel traffic would not affect marine mammal migration along the coast. Therefore, construction and operational activities would have no impacts under CEQA.

<u>NEPA Impact Determination</u>

As described for the Project in **Impacts BIO-2.1 and BIO-2.2**, no known terrestrial wildlife or aquatic species migration corridors are present in the harbor, and vessel traffic would not affect marine mammal migration along the coast. Therefore, construction and operational activities would have no impacts under NEPA.

Impact BIO-3: Loss of Marine Habitat

<u>CEQA Impact Determination</u>

Placement of fill (25.6 acres in Slip 1 plus 5.4 acres for Pier E expansion) and excavation in Slip 3 (6.3 acres) would be the same as for the Project (**Impact BIO-3.1**), but no Phase 2 fill or excavation would occur. Thus, the net marine habitat loss would be approximately 24.7 acres, and impacts would be significant under CEQA. The net loss of hard substrate habitat (pilings, bulkheads, and rock riprap) would be less than for the Project due to the smaller amount of fill and wharf removal, and impacts would be less than significant as described for the Project.

Mitigation Measure BIO-3 would apply to this alternative, but the number of credits required would be less. The Slip 1 fill and Slip 3 excavation would occur in the Inner Harbor for a net Inner Harbor loss of 19.3 acres while the Pier E extension would result in the loss of 5.4 acres of Outer Harbor habitat. Approximately 9.7 Bolsa Chica credits would be needed to mitigate the Inner Harbor habitat loss at a ratio of 0.5:1. For the Outer Harbor habitat loss, 5.4 Bolsa Chica credits would be needed to mitigate at a 1:1 ratio. Thus, the estimated number of Bolsa Chica credits required would be 15.1. As described for the Project, the actual number of credits needed would be determined based on “as-built” surveys and could range from 13 to 17.

NEPA Impact Determination

The federal portion of Alternative 2 would include the same habitat loss described under the CEQA impact determination for a net loss of 19.3 Inner Harbor acres and 5.4 Outer Harbor acres. This impact would be significant under NEPA. The small loss of hard substrate habitat would be a less than significant impact under NEPA.

Mitigation Measure BIO-3 would apply to this alternative, but the number of credits required would be reduced to 15.1. This mitigation measure would fully offset Alternative 2 impacts of marine habitat loss.

Impact BIO-4: Natural Habitats and Plant Communities

CEQA Impact Determination

The reduced amount of fill and excavation for Alternative 2 would result in a smaller, 24.7 acres versus 54.6 acres, permanent net loss of EFH in Middle Harbor than for the Project (**Impact BIO-4.1**), a significant impact under CEQA. The reduced amount of fill, excavation, dredging, and wharf construction activities in harbor waters would cause temporary but less than significant disturbances to habitat for FMP species. Construction activities in the backlands would have no direct effects on EFH or other natural habitats. Indirect effects through runoff of sediments and pollutants during storm events would be less than significant as described for water quality in Section 3.3. The increase in vessel traffic would be the same as for the Project (**Impact BIO-4.2**), and impacts would be less than significant. No kelp, eelgrass beds, salt marsh, or freshwater wetlands would be affected during construction or operations as described for the Project (**Impact BIO-4.1 and BIO-4.2**).

Mitigation Measure BIO-3, as described for the Project, would apply to this impact, but the number of Bolsa Chica credits needed would be reduced to 15.1 existing mitigation credits**.** This mitigation measure would fully offset Alternative 2 impacts to sustainable fisheries. No mitigation is required for runoff impacts.

NEPA Impact Determination

The reduced amount of fill and excavation for the federal portion of Alternative 2 would result in a smaller, 24.7 acres versus 54.6 acres, permanent net loss of EFH in Middle Harbor than for the Project (**Impact BIO-4.1**), a significant impact under NEPA. The reduced amount of fill, excavation, dredging, and wharf construction activities in harbor waters would cause temporary disturbances to habitat for FMP species that would be less than significant. Construction activities in the backlands would have no direct effects on EFH or other natural habitats. Indirect effects through runoff of sediments and pollutants from the new fill surfaces during storm events would be less than significant as described for water quality in Section 3.3. The increase in vessel traffic would be the same as for the Project (**Impact BIO-4.2**), and impacts would be less than significant. No kelp, eelgrass beds, salt marsh, or freshwater wetlands would be affected during construction or operations as described for the Project (**Impact BIO-4.1 and BIO-4.2**).

Mitigation Measure BIO-3, as described for the Project, would apply to this impact, but the number of Bolsa Chica credits needed would be reduced to 15.1 existing mitigation credits. This mitigation measure would fully offset Alternative 2 impacts to sustainable fisheries. No mitigation is required for runoff impacts.

BIO-5: Disruption of Local Biological Communities

CEQA Impact Determination

Alternative 2 construction activities would affect local biological communities as described for the Project (**Impact BIO-5.1**), but the amount of marine habitat filled (including riprap and bulkhead covered by the fill) would be less, and fewer pilings would be removed and installed. The temporary and permanent mooring dolphins would be part of Alternative 2. Based on pre-construction survey requirements, *Caulerpa* would not be spread as a result of Alternative 2 construction, and no impacts would occur. Impacts of construction would be less than significant under CEQA. As described for the Project under **Impact BIO-5.2**, runoff of contaminants, increased vessel traffic, and new lighting would not disrupt local biological communities, and impacts would be less than significant. The number of vessels and amount of ballast water discharged into the East Basin and, thus, the potential for introduction of invasive exotic species would be the same as for the Project (**Impact BIO-5.3**). Although *Caulerpa* is unlikely to be introduced by vessels, other invasive algal and invertebrate species could be introduced into Long Beach Harbor from these vessels. Impacts of invasive species would be significant under CEQA.

No mitigation measures are currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology. New technologies are being explored, and if methods become available in the future, they would be implemented as appropriate at that time.

NEPA Impact Determination

Alternative 2 construction activities would affect local biological communities as described for the Project (**Impact BIO-5.1**), but the amount of marine habitat filled (including riprap and bulkhead cover) would be less, and fewer pilings would be removed and installed. The temporary and permanent mooring dolphins would be part of Alternative 2. Based on pre-construction survey requirements, *Caulerpa* would not be spread as a result of Alternative 2 construction, and no impacts would occur. Impacts of construction would be less than significant under NEPA. As for the Project (**Impact BIO-5.2**), the increased vessel traffic and new lights would not disrupt local biological communities, and no significant impacts would occur under NEPA. The number of vessels and amount of ballast water discharged into East Basin and, thus, the potential for introduction of invasive exotic species would be the same as for the Project (**Impact BIO-5.3**). Although *Caulerpa* is unlikely to be introduced by vessels, other invasive algal and invertebrate species could be introduced into Long Beach Harbor from these vessels. However, the number of vessel calls per year would be equal to or less than the NEPA Baseline, resulting in no impacts of under NEPA.

3.4.2.5 Alternative 3 – Landside Improvements Alternative

Alternative 3 would redevelop existing terminal areas on Piers E and F and convert underutilized land north of the Gerald Desmond Bridge and Ocean Boulevard within the Project site to a container yard. No in-water activities, including dredging, filling Slip 1 and the East Basin, new wharf construction, wharf upgrades, or channel and berth deepening would occur.

BIO-1: Special Status Species

CEQA Impact Determination

Construction activities on land would not adversely affect any special status species, including the peregrine falcon and bats, as described for the Project under **Impact BIO-1.1**, and no impacts would occur under CEQA. Operational activities would result in no loss of individuals or habitat for rare, threatened, or endangered species, and underwater sound from Alternative 3 related vessels and offshore vessel transit would affect few if any marine mammals. Therefore, no significant impacts would occur under CEQA.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on biota and habitats would occur.

BIO-2: Wildlife Movement Corridors

CEQA Impact Determination

As described for the Project (**Impact BIO-2.1)**, construction of Alternative 3 facilities on land would not affect wildlife movement or migration corridors, resulting in no impacts under CEQA. Operation of the new terminal, including increased vessel traffic, would not affect wildlife movement or migration corridors as described for the Project (**Impact BIO-2.2**).

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on biota and habitats would occur.

BIO-3: Loss of Marine Habitat

CEQA Impact Determination

No loss of marine habitat would occur because no in-water construction, including placement of fill, would take place for Alternative 3. Therefore, no impacts would occur under CEQA.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on biota and habitats would occur.

BIO-4: Natural Habitats and Plant Communities

CEQA Impact Determination

Alternative 3 would result in no direct impacts to EFH, kelp, eelgrass beds, salt marsh, or freshwater wetlands because no in-water construction would occur and no freshwater wetlands or salt marshes are present on the backlands to be upgraded. Indirect effects of runoff from construction and operations on land would be less than significant as described for the Project (**Impact BIO-4.1 and BIO-4.2**).

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on biota and habitats would occur.

BIO-5: Disruption of Local Biological Communities

CEQA Impact Determination

Construction activities on backlands would result in temporary disturbances to existing industrialized terrestrial habitats with almost immediate recovery after construction is complete. Runoff of pollutants from backland construction activities, as described under **Impact BIO-5.1** for the Project, would have only localized, short-term, and less than significant effects on marine organisms in the vicinity of drain outlets due to implementation of runoff control measures that are part of Alternative 3. Operations would not result in substantial disruption of local biological communities due to runoff of contaminants or lighting. Impacts would, therefore, be less than significant. The increase in vessel traffic to the existing berths would not directly disrupt local fish communities because the individuals present in the harbor are likely acclimated to vessel noise. The greater number of vessels (227 above the CEQA Baseline) would, however, increase the potential for introduction of invasive species as described for the Project (**Impact BIO-5.3**). Although unlikely to occur, introduction of invasive species could substantially disrupt local biological communities. Impacts would, therefore, be significant under CEQA.

No mitigation measures are currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology. New technologies are being explored, and if methods become available in the future, they would be implemented as appropriate at that time.

NEPA Impact Determination

Alternative 3 is equivalent to the NEPA Baseline because it only includes construction and operational activities that would not require issuance of federal permits. As no federal action or permit would be required, there would be no significance determination under NEPA for this alternative. No impacts on biota and habitats would occur.

3.4.2.6 Alternative 4 – No Project Alternative

The No Project Alternative would not include construction of upland site improvements, including rail improvements and construction of the Pier E Substation, or in-water activities (i.e., dredging, filling of Slip 1 and the East Basin, and/or new wharf construction). However, forecasted increases in cargo would still occur under this alternative. Operational impacts associated with the following activities would occur: cargo ships that currently berth and load/unload at the terminal would continue to do so; terminal equipment would continue to handle cargo containers; and trucks would continue to transport containers to outlying distribution facilities.

CEQA Impact Determination

As no new construction activities would occur within the Project area, no impacts on marine biota or habitats would occur under CEQA. Operation of the existing facilities would result in an increase of 127 vessel calls per year (52 less than for the Project). Due to the larger number of vessels, the potential for introduction of invasive species (algae and invertebrates) through discharge of ballast water or via their hulls and other external machinery would increase. Impacts of invasive species would be significant under CEQA.

No mitigation measures are currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology. New technologies are being explored, and if methods become available in the future, they would be implemented as appropriate at that time.

NEPA Impact Determination

Under this alternative, no development would occur within the in-water Project area. Therefore, there would be no construction-related impact on marine biota or habitats under NEPA. The number of vessel calls at the existing berths would increase over time but would be less than the NEPA Baseline. Therefore, no impacts of invasive species would occur under NEPA.

3.4.3 Cumulative Impacts

The region of influence for cumulative impacts for biological resources varies by resource. For marine biota and water-associated birds, the region of analysis is the Long Beach/Los Angeles Harbor (Inner and Outer Harbor areas). Terrestrial biota, however, are limited to land portions of the harbor, and the region of analysis is limited to land areas at the Project site and extending approximately one mile in all directions.

Cumulative projects including the Piers G & J Redevelopment Project, Pier S Marine Terminal Project, Gerald Desmond Bridge Replacement Project, Berths 136-147 Marine Terminal, Evergreen Redevelopment/YTI Wharf Upgrade Project, Berths 97-109 Container Terminal Project, Channel Deepening Project, Pacific Los Angeles Marine Terminal, Cabrillo Way Marina (Phase II) Project, Pier 300 APL Container Terminal Expansion Project, Berths 212-224 YTI Project, Artificial Reef Project, and Berths 121-131 Yang Ming Container Terminal (Table 2.1-1 and Figure 2.1-1) would directly affect marine biological resources through fill (approximately 277 acres of which about 105 acres are completed or under construction), dredging, wharf construction/ reconstruction, installation of boat slips, artificial reef construction, and/or rocky dike construction. Wharf construction and reconstruction would also result in underwater sound pressure waves from pile driving that could affect marine mammals and fish. Increased vessel traffic associated with some of the cumulative projects would increase the potential for introduction of invasive species. Further, all of the cumulative projects would have the potential to indirectly affect marine biological resources through runoff of sediments and pollutants as a result of construction and operations activities on land.

Three cumulative projects have the potential to adversely affect the California least tern, an endangered species, and those cumulative impacts would be significant but feasibly mitigated. Increased vessel traffic as a result of the cumulative projects would have less than significant cumulative impacts within the harbor because few marine mammals would be affected (small numbers are present in the harbor), individuals would avoid the vessels, and overall underwater noise levels would not be significantly increased. The increase in vessel traffic, particularly large vessels travelling at greater than 10 knots, would increase the potential for vessel strikes of whales. Mortality of blue whales is a particular concern, and cumulative impacts would be significant and unavoidable for this species. The Project would not contribute to cumulative effects on the least tern because this species would not be affected, and the Project would not make a cumulatively considerable contribution to cumulative effects of vessel sound on marine mammals. Project-related vessel strikes to blue whales would be unlikely to occur; however, any that did occur would make a cumulatively considerable contribution to significant and unavoidable cumulative impacts associated with vessel strikes to that species. Therefore, a decrease in vessel traffic relative to the NEPA Baseline would reduce the potential for a blue whale strike and would not contribute to cumulative impacts. The small increase in vessel traffic in the harbor (3.4 percent) caused by the Project, relative to the CEQA Baseline, would add to that cumulative potential, resulting in a cumulatively considerable effect.

The projects in Table 2.1-1 would have no cumulative impacts on migration or movement of fish and terrestrial wildlife because no known migration corridors would be affected. Blue and gray whale migration along the coast would not be adversely affected by increased vessel traffic. The Project also would not affect migration or movement of fish and wildlife and, therefore, would not contribute to cumulative effects.

Six of the cumulative projects would involve placement of fill, totaling a loss of approximately 277 acres of marine habitat. These losses would be mitigated through use of existing mitigation bank credits from offsite marine habitat restoration through agreements with regulatory agencies. Therefore, cumulative impacts would be less than significant. The Middle Harbor Redevelopment Project would contribute 54.6 acres, or about 16 percent, of the approximately 332 acres of fill recently completed or proposed for the harbor (including the Project). The permanent marine habitat loss from the Project would also include EFH. The Project would make a cumulatively considerable contribution to habitat loss prior to mitigation, but this impact would be mitigated to less than significant levels with the implementation of **Mitigation Measure BIO-3**.

Construction activities in harbor waters associated with the cumulative projects, such as dredging, excavation, and wharf construction, would remove soft bottom habitat as well as temporarily remove hard substrate habitat (e.g., piles and rocky dikes). The rocky dikes would be replaced and new pilings would be installed. The effects of such activities are generally of short duration, affect small, localized areas, and do not occur simultaneously for all projects. Because recolonization of dredged areas and new in-water structures begins quickly (hours to days) and proceeds rapidly (months to years), these areas would be expected to generate typical productivity and food sources for other species such as fish within a relatively short time. Accordingly, multiple projects spread over time would not be expected to result in a substantial reduction in forage base that could affect predatory species. Temporary construction disturbances in the water that can cause fish and marine mammals to avoid the work area are also not expected to substantially alter the distribution and abundance of these organisms due to the cumulative projects. Consequently, cumulative impacts of such disturbances on local biological communities would be less than significant because the effects would be dispersed in time and space. Project construction activities related to dredging, excavation, and wharf construction would have less than significant impacts on local biological communities, and these activities would not contribute substantially to cumulative impacts of other projects that could take place concurrently.

Runoff from temporary disturbances on land during construction of cumulative project facilities would not occur simultaneously, but rather would be spread over time so that total runoff to harbor waters would be dispersed, both in frequency and location. Cumulative impacts would be less than significant due in part to this dispersal, in part because cumulative project levels of development in the harbor would affect minimal amounts of land, and in part because runoff control measures, such as SWPPPs, would be implemented as required in project permits. The Project's contribution to this runoff would not be cumulatively considerable for the same reasons.

One or more of the cumulative projects would have temporary and less than significant impacts on terrestrial biota and habitats during construction that would not result in a significant cumulative impact on local biological communities. This is because these projects would only affect small areas at a time and would have minimal effects on biological communities in industrial areas. The Project would not result in any cumulatively considerable effects on terrestrial biological communities because it would have minimal effects on terrestrial habitats in an existing industrial area and would not disrupt existing biological communities.

Several of the cumulative projects would add vessel traffic to the harbors above baseline levels, thus increasing the risk of invasive species introduction. Many non-native species have already been introduced into the harbor and this would continue with the potential to have significant cumulative impacts on local biological communities. However, current ballast water regulations would reduce, but not eliminate, this potential. The Project would decrease vessel traffic in the Harbor relative to the NEPA Baseline and, thus, would not contribute to cumulative impacts. The small increase in vessel traffic in the harbor (3.4 percent) caused by the Project, relative to the CEQA Baseline, would add to that cumulative potential, resulting in a cumulatively considerable effect. Although regulations are currently being developed by the state to address ballast water discharges, no feasible mitigation measures are available to prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology.

3.4.4 Mitigation Monitoring Program

Implementation of **Mitigation Measure BIO-3** would be required to reduce impacts on biota and habitats. This mitigation measure and monitoring requirements are summarized in Table 3.4-5.

Table 3.4-5. Mitigation Monitoring Program

Mitigation Measure	Responsible Party	Timing/Frequency
BIO-3: Compensate for loss of marine habitat in Slip 1 and the East Basin through use of existing mitigation bank credits.	POLB and USACE	Upon completion of Project construction and as-built surveys.

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