3.2

AIR QUALITY AND GREENHOUSE GASES

3.2.1 Introduction

This section describes the environmental setting for air quality and GHG conditions within the PMPU area and surrounding region, identifies applicable regulations, and analyzes the potential impacts that could result from implementing the proposed Program. Mitigation measures and the significance of impacts after mitigation are also described.

3.2.2 Environmental Setting

The proposed Program includes the PMPU area within the Port. The air quality area of influence is the SCAB, which consists of the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties and all of Orange County. The air basin covers an area of approximately 6,000 square miles and is bounded on the west by the Pacific Ocean; on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains; and on the south by the San Diego County line.

3.2.2.1 Regional Climate and Meteorology

The climate of the proposed Program region is classified as Mediterranean, characterized by warm, dry summers and mild, wet winters. The major influence on the regional climate is the Eastern Pacific High (a strong persistent area of high atmospheric pressure over the Pacific Ocean), topography, and the moderating effects of the Pacific Ocean. Seasonal variations in the position and strength of the Eastern Pacific High are a key factor in the weather changes in the area.

The Eastern Pacific High attains its greatest strength and most northerly position during the summer, when the High is centered west of northern California. In this location, the 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 from 1,000 to 2,500 feet above mean sea level (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 Los Angeles Basin 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 of over 16.8 million people, are responsible for the high pollutant concentrations that can occur in the SCAB. In addition, the warm temperatures and high solar radiation during the summer months promote the formation of ozone (O_3), which has its highest levels during the summer.

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 Proposed Program 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.

During the 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 ventilate the SCAB of air pollutants.

The Palos Verdes Hills have a major influence on wind flow in the Port. 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 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 Port.

3.2.2.2 Air Pollutants and Air Monitoring

3.2.2.2.1 Criteria Pollutants

Air quality at a given location can be characterized by the concentration of various pollutants in the air. Units of concentration are generally expressed as parts per million (ppm) by volume or micrograms per cubic meter ($\mu g/m^3$) of air. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate national or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which the public health and welfare are protected. They include a reasonable margin of safety to protect the more sensitive individuals in the population.

Pollutants for which ambient air quality standards have been adopted are known as criteria pollutants. These pollutants can harm human health and the environment, and cause property damage. These pollutants are called "criteria" air pollutants because they are regulated by developing human health-based and/or environmentally based

criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called the primary standards. Another set of limits intended to prevent environmental and property damage is called the secondary standards. The criteria pollutants of greatest concern in this air quality assessment are O_3, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM_{10}, and $PM_{2.5}$. NO_x and SO_x refer to generic groups of compounds that include NO_2 and SO_2, respectively, because NO_2 and SO_2 are naturally highly reactive and may change composition when exposed to oxygen, other pollutants, and/or sunlight in the atmosphere. These oxides are produced during combustion.

The USEPA establishes the National Ambient Air Quality Standards (NAAQS), and defines how to demonstrate whether an area meets the NAAQS. The CARB establishes the California Ambient Air Quality Standards (CAAQS), which must be equal to or more stringent than the NAAQS when initially adopted. CARB defines how to demonstrate whether an area meets the CAAQS. Table 3.2-1 presents the NAAQS and CAAQS.

Table 3.2-1. California and National Ambient Air Quality Standards

Pollutant	*Averaging Time*	*California Standards*	*National Standards*	
			Primary	*Secondary*
Ozone (O_3)	1-hour	0.09 ppm	---	Same as primary
	8-hour	0.07 ppm	0.075 ppm	
Carbon monoxide (CO)	8-hour	9.0 ppm	9 ppm	---
	1-hour	20 ppm	35 ppm	---
Nitrogen dioxide (NO_2)	Annual	0.03 ppm	0.053 ppm	Same as primary
	1-hour	0.18 ppm	0.10 ppm	---
Sulfur dioxide (SO_2)	3-hour	---	---	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	---
Respirable Particulate Matter (PM_{10})	Annual	20 µg/m^3	---	---
	24-hour	50 µg/m^3	150 µg/m^3	Same as primary
Fine Particulate Matter ($PM_{2.5}$)	Annual	12 µg/m^3	15 µg/m^3	Same as primary
	24-hour	---	35 µg/m^3	Same as primary
Lead	Rolling 3-month average	---	0.15 µg/m^3	Same as primary
	Quarterly Average	---	1.5 µg/m^3	Same as primary
	30-day average	1.5 µg/m^3	---	---
Hydrogen sulfide	1-hour	0.03 ppm	---	---
Sulfates	24-hour	25 µg/m^3	---	---
Vinyl Chloride	24-hour	0.01 ppm	---	---

Notes:

a. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

b. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Source: CARB 2012a

As discussed above, one of the main concerns with criteria pollutants is that they contribute directly to regional human health problems. The known adverse effects associated with these criteria pollutants are shown in Table 3.2-2.

Table 3.2-2. Adverse Effects Associated with the Criteria Pollutants

Pollutant	*Adverse Effects*
Ozone (O_3)	(a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals and 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage.
Carbon Monoxide (CO)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	(a) Broncho-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma.
Respirable Particulate Matter (PM_{10})	(a) Excess deaths from short-term and long-term exposures; (b) Excess seasonal declines in pulmonary function, especially in children; (c) Asthma exacerbation and possibly induction; (d) Adverse birth outcomes including low birth weight; (e) Increased infant mortality; (f) Increased respiratory symptoms in children such as cough and bronchitis; and (g) Increased hospitalization for both cardiovascular and respiratory disease (including asthma).
Fine Particulate Matter ($PM_{2.5}$)	(a) Excess deaths from short-term and long-term exposures; (b) Excess seasonal declines in pulmonary function, especially in children; (c) Asthma exacerbation and possibly induction; (d) Adverse birth outcomes including low birth weight; (e) Increased infant mortality; (f) Increased respiratory symptoms in children such as cough and bronchitis; and (g) Increased hospitalization for both cardiovascular and respiratory disease (including asthma).
Lead	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction, and neurotoxin.
Sulfates	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardiopulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage.

Notes:

a. Detailed discussions on the health effects associated with exposure to suspended PM can be found in the following documents: Office of Environmental Health Hazard Assessment (OEHHA), Particulate Matter Health Effects and Standard Recommendations (www.oehha.ca.gov/air/toxic_contaminants/PM_{10}notice.html#may), May 9, 2002 and USEPA, Air Quality Criteria for Particulate Matter, October 2004a.

b. The SCAQMD has not established an emissions threshold for sulfates, nor does it require dispersion modeling against the localized significance thresholds.

c. CAAQS have also been established for hydrogen sulfide, vinyl chloride, and visibility reducing particles. They are not shown in this table because they are not pollutants of concern for the proposed Program.

Source: SCAQMD et al. 2007

Of the criteria pollutants of concern, O_3 is unique because it is not directly emitted from air pollutant sources. Rather, O_3 is a secondary pollutant, formed from the precursor pollutants: volatile organic compounds (VOCs) 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, O_3 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, O_3 impacts are indirectly addressed in this study by comparing proposed Program-generated emissions of VOCs and NO_x to daily emission thresholds set by the SCAQMD. These emission thresholds are discussed in Section 3.2.2.5, Sensitive Receptors.

Generally, concentrations of photochemical pollutants, such as O_3, are highest during the summer months and coincide with the season of maximum solar insolation. Concentrations of inert pollutants, such as CO, 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 concentrations may occur during high wind events or near man-made ground-disturbing activities, such as vehicular activities on roads and earth moving during construction activities.

As most proposed Program-related emission sources would be diesel-powered, 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 also classified as a toxic air contaminant (TAC) by the CARB. 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.

3.2.2.2.2 Local Air Monitoring Levels

The USEPA designates all areas of the U.S. according to whether they meet the NAAQS. A nonattainment designation means that one or more of the six criteria pollutants, considered as indicators of air quality, exceeds the primary NAAQS in any given area over a period of time specified by the NAAQS. USEPA currently designates the SCAB as in extreme nonattainment for 8-hour O_3, serious nonattainment for PM_{10}, and nonattainment for lead and $PM_{2.5}$. The SCAB is in attainment of the CO, SO_2 and 1-hour and annual NO_2 NAAQS. It is a maintenance area for CO and annual NO_2, meaning that historically it was in nonattainment of these standards.

The CARB also designates areas of the state according to whether they meet the CAAQS. A nonattainment designation means that a CAAQS has been exceeded more than once in 3 years. The CARB currently designates the SCAB as an "extreme" nonattainment area for O_3 and nonattainment for NO_2, PM_{10}, $PM_{2.5}$, and lead. The air basin is in attainment for CO, SO_2, and sulfates, and is unclassified for hydrogen sulfide and visibility reducing particles.

The SCAQMD maintains a network of air quality monitoring stations throughout the SCAB, which measure ambient concentrations of criteria air pollutants. The nearest SCAQMD air monitoring station to the Port is the North Long Beach Monitoring Station (Station No. 072), which is located at 3648 Long Beach Boulevard. Data from this station are used to describe the historical air quality of the proposed Program region, as it is the closest station to the Port with the longest period of record of measured air quality.

The LAHD initiated its own air quality monitoring program in February 2005. The main objective of the program is to estimate ambient levels of DPM near the Port. The secondary objective of the program is to estimate ambient PM levels within

adjacent communities due to Port emissions. To achieve these objectives, the program measures ambient concentrations of PM_{10}, $PM_{2.5}$, and elemental carbon $PM_{2.5}$ (which indicates fossil fuel combustion sources) at four locations in the Port vicinity (Port 2011a). In 2008, the Port also began measuring ambient concentrations of O_3, SO_2, NO_2, and CO. The station locations are as follows.

- **Wilmington Station - Located at the Saints Peter and Paul School.** This station is located adjacent to residential areas in the central part of Wilmington and it measures aged urban emissions during offshore flows and a combination of marine aerosols (salt spray from the ocean that typically consists of sodium chloride [table salt] and other salts and organic matter), aged urban emissions (man-made and naturally occurring airborne particulates that have been in the atmosphere long enough to have undergone some chemical reaction or accumulation with other airborne compounds or particles), and fresh emissions from Port operations during onshore flows. This station also provides information on the relative strengths of these source combinations.
- **Coastal Boundary Station - Located at Berth 47 in the Port Outer Harbor.** This station measures aged urban and Port emissions and marine aerosols during onshore flows and aged urban emissions and fresh Port emissions during offshore flows.
- **Source-Dominated Station - Located at the Terminal Island Water Reclamation Plant.** This site is surrounded by three terminals and has a potential to receive substantial amounts of emissions from off-road equipment, on-road trucks, and rail. During onshore flows, this station measures marine aerosols and fresh emissions from several nearby diesel-fired sources (trucks, trains, and ships). During offshore flows, this station measures aged urban emissions and Port emissions. Meteorological data from this site were used in dispersion modeling analyses to estimate potential human health risks and criteria pollutant impacts from the PMPU.
- **San Pedro Station - Located near the intersection of Harbor Boulevard the 3rd Street, along the San Pedro Waterfront Promenade.** This location is near the western edge of Port operational emission sources and adjacent to residential areas in San Pedro. During onshore flows, aged urban emissions, marine aerosols, and fresh Port emissions have the potential to affect this site. During nighttime offshore flows, this site measures aged urban emissions and Port emissions.

Table 3.2-3 presents the highest pollutant concentrations recorded at the SCAQMD North Long Beach and Port monitoring stations for the period ranging from 2008 through 2010.

Air quality within the SCAB has generally improved since the inception of air pollutant monitoring in 1976. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and SCAQMD's implementation of emission reduction strategies. This trend towards cleaner air has occurred in spite of continued population growth.

Table 3.2-3. Maximum Ambient Air Pollutant Concentrations Measured within the Port Region

Pollutant	*Averaging Period*	*Port of Los Angeles Monitoring Station*				*SCAQMD Monitoring Station*
		Wilmington Community	*Coastal Boundary*	*San Pedro*	*Source-Dominated*	*North Long Beach*
Ozone (ppm)	1 hour	**0.110**	**0.130**	0.081	**0.140**	**0.101**
	8 hours	**0.087**	**0.076**	0.064	0.062	**0.084**
CO (ppm)	1 hour	4.6	2.2	2.7	4.9	3
	8 hours	2.8	2.1	1.4	1.6	2.6
NO_2 (ppm)	1 hour (State standard)	0.098	0.093	**0.200**	0.099	0.13
	1 hour (98th percentile)	0.079	0.066	0.089	0.088	0.07
	Annual	0.023	0.011	0.020	0.022	0.021
SO_2 (ppm)	1 hour (State standard)	0.029	0.080	0.031	0.048	0.09
	1 hour (99th percentile)	0.030	0.027	0.030	0.059	na
	Annual	0.0025	0.0009	0.0022	0.0065	na
	24 hours	na	na	na	na	0.012
PM_{10} ($\mu g/m^3$)	24 hours	46.6	48.9	na	na	**62**
	Annual	**25.9**	**24.0**	na	na	**30.5**
$PM_{2.5}$ ($\mu g/m^3$)	24 hours (98th percentile)	21.9	22.8	21.6	25.4	**38.9**
	Annual	9.3	8.9	11.4	11.4	**14.2**
Lead ($\mu g/m^3$)	30 days	na	na	na	na	0.01
	Calendar quarter	na	na	na	na	0.01
	Rolling 3-month average	na	na	na	na	na
	Annual	na	na	na	na	na
Sulfates ($\mu g/m^3$)	24 hours	na	na	na	na	13.6

Notes:

a. Data from the SCAQMD North Long Beach monitoring site were collected between January 2008 and December 2010. Port O_3, CO, NO_2 and SO_2 data were collected over the period from May 2009 through April 2011. PM_{10} is not measured at the San Pedro Community site or Source-Dominated site. Port PM_{10} 24-hour data is presented for the available period May 2010 through April 2011; PM_{10} annual data is presented for the period May 2008 through April 2011. Port $PM_{2.5}$ 24-hour and annual data is presented for the period May 2008 through April 2011.

b. na = not available.

c. Concentrations exceeding the most restrictive relevant AAQS are **bolded.**

Sources: Port 2011a; SCAQMD 2012a

3.2.2.2.3 Toxic Air Contaminants

TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs include air pollutants that can produce adverse human health effects, including carcinogenic effects, after short-term (acute) or long-term (chronic) exposure. Examples of TAC sources within the SCAB include industrial processes, fossil fuel combustion sources, dry cleaners, gasoline stations, and paint and solvent operations.

Exposure to TACs can produce a wide range of health effects, depending on the type of contaminant, the duration and intensity of the exposure, and the health of the individual. These health effects include those identified in Table 3.2-2, and also 1) irritation to the eyes, nose, throat and lungs, 2) increased susceptibilities to allergies, 3) cancers (primarily lung), and 4) premature deaths.

In 2008, the SCAQMD determined in the Multiple Air Toxics Exposure Study III (MATES III) that about 84 percent of the background airborne cancer risk in the SCAB is due to diesel exhaust (SCAQMD 2008). The highest risk levels were found in urban core areas in south central Los Angeles County, in Wilmington adjacent to the Port, and near transportation corridors and freeways. Compared to the MATES II study, which was conducted in 2000, the MATES III study found a decrease in carcinogenic risk, with the population-weighted risk down by 17 percent from the analysis in MATES II. A CARB report titled *Diesel Particulate Matter Exposure Assessment Study for the Ports of Los Angeles and Long Beach* also indicated that the two ports contributed approximately 21 percent of the total DPM emissions in the air basin during 2002 (CARB 2006a).

As discussed in Section 3.2.3.4, Regional and Local Regulations and Plans, in 2006 the Port and the Port of Long Beach developed the *San Pedro Bay Ports Clean Air Action Plan* (CAAP) that promotes emission reduction measures for Port operations, with added focus on TACs and DPM. Through 2011, the Port of Los Angeles had achieved reductions of 71 percent for DPM, 51 percent for NO_x, and 76 percent for SO_x, when compared to 2005 levels (Starcrest Consulting Group, LLC. 2012). Similar reductions have been observed at the Port of Long Beach. As part of the CAAP, the ports established uniform air quality standards at program, project-specific, and source-specific levels. All major development projects are required to include an HRA to further assess TAC emissions and to target mitigations to reduce impacts to public health.

3.2.2.2.4 Secondary $PM_{2.5}$ Formation

Within the SCAB, $PM_{2.5}$ particles are both directly emitted into the atmosphere (e.g., primary particles) and formed through atmospheric chemical reactions from precursor gases (e.g., secondary particles). Primary $PM_{2.5}$ includes diesel soot, combustion products, road dust, and other fine particles. Secondary $PM_{2.5}$, which includes chemicals such as sulfates, nitrates, and complex carbon compounds, are formed from reactions with directly emitted NO_x, SO_x, VOCs, and ammonia (SCAQMD 2006).

Emissions of NO_x, SO_x, and VOCs generated by the PMPU would contribute toward secondary $PM_{2.5}$ formation some distance downwind of the emission sources. However, the air quality analysis in this PEIR focuses on the effects of direct $PM_{2.5}$ emissions generated by the PMPU and its alternatives. This approach is consistent with the recommendations of the SCAQMD (SCAQMD 2006).

3.2.2.2.5 Ultrafine Particles

Although USEPA and the State of California currently monitor and regulate PM_{10} and $PM_{2.5}$, research is being done on ultrafine particles (UFPs), particles classified as

less than 0.1 micron in diameter. UFPs are formed usually during combustion, independent of fuel type. When diesel fuel is used, UFPs can be formed directly from fuel combustion. With gasoline and natural gas (liquefied or compressed), UFPs are formed mostly from the burning of lubricant oils. UFPs are emitted directly from the tailpipe as solid particles (soot, or elemental carbon and metal oxides) and semi-volatile particles (sulfates and hydrocarbons) that coagulate to form particles.

The research regarding UFPs suggests UFPs might be more dangerous to human health than the larger PM_{10} and $PM_{2.5}$ particles (termed fine particles) due to size and shape. Because of the smaller size, UFPs are able to travel more deeply into the lung (the alveoli) and are deposited in the deep lung regions more efficiently than fine particles. UFPs are inert; therefore, normal bodily defense does not recognize the particle. UFPs might have the ability to travel across cell layers and enter into the bloodstream and/or into individual cells. With a large surface area-to-volume ratio, other entities might attach to the particle and travel into the cell as a kind of "hitchhiker." Recent studies have found that UFPs may also pose a risk to cardiovascular health, particular in at-risk individuals, and may be a risk-factor for heart arrhythmias (University of California, Los Angeles 2010).

The University of Southern California, in collaboration with CARB and California Environmental Protection Agency (CalEPA), released a study in April 2011 investigating UFP concentrations within communities in Los Angeles, including the ports area of San Pedro and Long Beach (University of Southern California 2011). The study found that UFP concentrations vary significantly near the ports (a major UFP source) and therefore it substantiated concerns about the applicability of using average UFP concentrations for estimating population exposure.

Current UFP research focuses primarily on roadway exposure. Preliminary studies suggest that over 50 percent of an individual's daily exposure is from driving on highways (Fruin et al. 2004). Levels appear to drop off rapidly as one moves away from major roadways (Zhu et al. 2002a, 2002b). Little research has been done directly on ships and off-road vehicles. Work is being done on filter technology, including filters for ships, which appears promising (Port 2011b). The LAHD collects UFP levels at its four air quality monitoring stations. The Port actively participates in the CARB testing at the Port and will comply with all future regulations regarding UFPs. Additionally, measures included in the CAAP aim to reduce all emissions Port-wide.

3.2.2.2.6 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.

Port emissions deposit into both local waterways and regional land areas. Construction and operational emission sources from the proposed Program would

produce DPM, which contains trace amounts of toxic chemicals, and gaseous pollutants. Through the CAAP, the Port will reduce air pollutants from its future operations, which will work towards the goal of reducing atmospheric deposition for purposes of water quality protection. The CAAP will reduce air pollutants that generate both acidic and toxic compounds, including emissions of VOCs, NO_x, SO_x, and DPM.

3.2.2.3 Greenhouse Gases and Climate Change

It is well-documented that the Earth's climate has fluctuated throughout its history. However, scientific evidence indicates a correlation between increasing global temperatures over the past century and the worldwide proliferation of GHG emissions by mankind. Climate change associated with global warming is predicted to produce negative economic and social consequences across the globe.

The accumulation of GHGs in the atmosphere regulates the earth's temperature by retaining heat near the surface. Without this natural greenhouse effect, the average surface temperature of the Earth would be about 60°F colder (U.S. Global Change Research Program [USGCRP] 2009). The direct environmental effect of GHG emissions is to increase global temperatures, which indirectly causes numerous environmental and social effects. The area of influence for proposed GHG impacts would be global in nature. However, these cumulative global impacts would be manifested as impacts on resources and ecosystems in California.

Emissions of GHGs occur from natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons [HFCs] and perfluorocarbons) and sulfur hexafluoride. These six GHGs are identified in California Assembly Bill (AB) 32 and by the USEPA.

Each GHG is assigned a global warming potential (GWP), which is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a GWP value of one. For example, 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. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emission of each GHG by its GWP and adding the products together to produce a single, combined emission rate representing all GHGs.

Numerous studies document the recent trend of rising atmospheric concentrations of CO_2. The longest continuous record of CO_2 monitoring extends back to 1958 (Keeling and Scripps Institution of Oceanography1960). These data show that atmospheric CO_2 levels have increased an average of 1.5 ppm per year over the last 53 years (NOAA 2012). As of 2011, CO_2 levels are about 30 percent higher than the highest levels estimated for the 800,000 years preceding the industrial revolution, as determined from CO_2 concentrations analyzed from air bubbles in Antarctic ice core samples (USGCRP 2009).

Recent observed environmental changes due to global warming include rising temperatures, shrinking glaciers and sea ice, sea level rise (SLR), a lengthened

growing season, and shifts in plant and animal ranges. International, national, and state organizations independently confirm these findings and predict that climate change will continue into the foreseeable future (Intergovernmental Panel on Climate Change 2007; USGCRP 2009; California Energy Commission 2012).

The most recent *Assessment* on *Climate Change in California* predicts that temperatures in California will increase between 4.1°F to 8.6°F by 2100, based upon low and high global GHG emission scenarios (California Energy Commission 2012). Predictions of long-term negative environmental impacts due to global warming include SLR, 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 substantial reduction in winter snow pack. In California, predictions of these effects include exacerbation of air quality problems, a reduction in municipal water supply from the Sierra snowpack, a rise in sea level that would displace coastal businesses and residences, an increase in wild fires, damage to marine and terrestrial ecosystems, and an increase in the incidence of infectious diseases, asthma, and other human health problems (California Energy Commission 2012).

Over the past several decades, sea level along the California coast has risen at a rate of about 0.67 to 0.79 inches per decade (California Climate Change Center 2009). This rate of SLR is predicted to increase in the future. The California Sea Level Rise Task Force recommends a range of future SLR estimates for state agencies to consider for planning future development projects (Coastal and Ocean Working Group of the California Climate Action Team [CO-CAT] 2010). These projections identify that sea levels will rise an average of 14 and 47 inches by years 2050 and 2100, respectively, compared to 2000 levels.

The 2009 California Climate Adaptation Strategy is a multi-sector strategy with the objective to guide California's efforts in adapting to climate change impacts. The Adaptation Strategy summarizes the science on climate change impacts in seven specific sectors and provides recommendations on how to prepare for those threats. As part of the Adaptation Strategy mandate, the California Natural Resources Agency and the California Energy Commission developed Cal-Adapt, a web-based climate change adaptation tool. The Cal-Adapt tool enables users to identify potential climate change risks in specific areas throughout California. It is important to note that climate change models are intentionally conservative and may overestimate atmospheric heat retention and climate change impacts. Cal-Adapt projects the following in the areas surrounding the Port:

- Temperature rise of 1 to 6°F by the end of the century; and,
- Decrease of approximately 3 to 5 inches in annual precipitation by the end of the century (California Energy Commission 2011).

Cal-Adapt has not assigned wildfire risk, snow pack change, or sea level rise to the area.

The air quality analysis in this PEIR estimates GHG emissions generated by the Port in 2011 and potential GHGs predicted for the PMPU, as presented in Sections 3.2.2.4, Port Baseline Emissions, and 3.2.3.3, State Regulations, respectively. In keeping with international convention, the GHG emissions in this report are expressed in metric units (metric tons [tonnes], in this case).

3.2.2.3.1 Sustainability and Port Climate Action Plan

In May 2007, the City of Los Angeles Mayor's Office released the Green LA initiative, which is an action plan to lead the nation in fighting global warming (City of Los Angeles 2007). The Green LA Plan presents a citywide framework for confronting global climate change to create a cleaner, greener, sustainable Los Angeles. The Green LA Plan directs the Port to develop an individual Climate Action Plan, consistent with the goals of Green LA, to examine opportunities to reduce GHG emissions from its operations.

In accordance with this directive, the Port's Climate Action Plan developed in December of 2007 covers currently listed GHG emissions related to the Port's activities (such as Port buildings, and Port workforce operations) (LAHD 2007). The Climate Action Plan outlines specific steps that LAHD has taken and will take on global climate change. These steps include specific actions that will be taken for energy audits, green building policies, onsite photovoltaic solar energy, green energy procurement, tree planting, water conservation, alternative fuel vehicles, increased recycling, and green procurement. The document also assesses CAAP measures that offer the co-benefit of GHG reduction.

The Port 2011 Sustainability Report provides an assessment of existing programs and policies that address the Port's material issues related to sustainability: Green Growth; Health Risk Reduction; Air Quality; Energy and Climate Change; Water Quality; Habitat Protection; Open Space and Greening; Land Use; Local Economic Development; and Environmental Justice (Port 2011c).

The Port also completes annual GHG inventories of the Port and reports these to the appropriate climate registry. The 2006-2009 data were reported to the CCAR and 2010 data were reported to TCR after CCAR transitioned their reporting operations to this entity (TCR 2012). In the future, the Port will report GHG data to TCR.

The Port, as a Department of the City of Los Angeles and as a port associated with a major city, is a participant in the Clinton Climate Initiative as a C40 City. The Port is also a signatory to the California Sustainable Goods Movement Program and a Lead Port in the International Association of Ports and Harbors World Ports Climate Initiative.

3.2.2.4 Port Baseline Emissions

The PMPU would affect land use designations throughout the Port area. Therefore, the Port-wide air emissions estimated for calendar year 2011 are used to define the CEQA baseline emission conditions for the PMPU.

The analysis of air quality impacts is based on a comparison of the proposed Program to the baseline existing conditions. This is consistent with CEQA Guidelines Section 15125 which states that the environmental setting "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. This approach was recently confirmed in Sunnyvale West Neighborhood Association v. City of Sunnyvale (2010) 190 Cal. App. 4th 1351. Future conditions that could be affected by rules and regulations implemented over time were not

considered in the baseline. Only rules and regulations effective by December 31, 2011 are included in the baseline for the source categories listed.

3.2.2.4.1 Criteria Pollutant Emissions

Table 3.2-4 summarizes the annual criteria pollutant emissions estimated for operations at the Port in year 2011 (Starcrest Consulting Group, LLC. 2012). This study inventoried source operations that occurred within the Port area and extended to the boundaries of the SCAB. Operational sources are from essentially all types of cargo handling and transfer activities that exist at the Port today. Emission sources associated with these operations include OGVs, tugboats, terminal equipment, on-road trucks, and trains. To facilitate the evaluation of proposed emissions, average daily Port-wide emissions were estimated from these data and presented in Table 3.2-5. The average daily emissions represent the annual emissions divided by 365 days per year. Average daily emissions are a good indicator of Port operations over the long term, as Port operations vary substantially from day-to-day due to the presence or lack of ship calls and associated cargo handling activities.

Table 3.2-4. 2011 Operational Criteria Pollutant Emissions for the Port

Emission Source Category	*Annual Emissions (Tons)*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Ocean Going Vessels (OGVs)	220	447	3,821	1,275	174	153
Harbor Craft	72	382	879	1	35	33
Cargo Handling Equipment	69	664	831	2	25	23
Locomotives	55	196	1,052	6	30	28
Heavy-duty Vehicles	66	348	1,406	4	23	21
Total Emissions	**482**	**2,037**	**7,989**	**1,287**	**287**	**258**

Note: Emissions might not add precisely due to rounding.
Source: Starcrest Consulting Group, LLC. 2012

Table 3.2-5. 2011 Average Daily Operational Criteria Pollutant Emissions for the Port

Emission Source Category	*Average Daily Emissions (Pounds)*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
OGVs	1,205	2,449	20,937	6,986	953	838
Harbor Craft	395	2,093	4,816	5	192	181
Cargo Handling Equipment	378	3,638	4,553	11	137	126
Locomotives	301	1,074	5,764	33	164	153
Heavy-duty Vehicles	362	1,907	7,704	22	126	115
Total Emissions	**2,641**	**11,162**	**43,775**	**7,058**	**1,573**	**1,414**

Notes:
a. Data estimated by dividing 2011 Port of Los Angeles annual emissions by 365 days per year.
b. Emissions might not add precisely due to rounding.

3.2.2.4.2 Greenhouse Gas Emissions

Table 3.2-6 summarizes the annual GHG emissions estimated for operations at the Port for CEQA baseline year 2011 (Starcrest Consulting Group, LLC. 2012). Similar to the method used to develop the 2011 Port criteria pollutant inventory presented in Table 3.2-4, these data represent operations that occurred within the Port area and extended to the boundaries of the SCAB.

Table 3.2-6. 2011 Operational GHG Emissions for the Port

Emission Source	*Annual Metric Tons Per Year of CO_2e*
OGVs	231,941
Harbor Craft	51,901
Cargo Handling Equipment	145,409
Locomotives	69,505
Heavy-duty Vehicles	348,555
Total Emissions	**847,311**

Note: Emissions might not add precisely due to rounding.
Source: Starcrest Consulting Group, LLC. 2012

3.2.2.5 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. The locations of these groups include residences (including people that live aboard vessels in Port marinas), schools, daycare centers, convalescent homes, and hospitals. Nearly all of these receptor groups occur in direct proximity to Port emissions.

3.2.3 Applicable Regulations

The federal Clean Air Act (CAA) of 1970 and its subsequent amendments form the basis for the nation's air pollution control efforts and the subsequent air quality regulations, such as the NAAQS. The USEPA is responsible for implementing most aspects of the CAA. Basic elements of the CAA include the NAAQS for criteria air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O_3 protection, and enforcement provisions. The CAA delegates enforcement of these standards to the states. In California, the CARB is responsible for enforcing air pollution regulations. The CARB has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agencies. In the SCAB, the local air agency responsible for regulating stationary sources is the SCAQMD.

The following is a summary of key federal, state, and local air quality rules, policies, and agreements that potentially would apply to the PMPU and its related activities.

3.2.3.1 International Regulations

3.2.3.1.1 IMO International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI

The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The International Maritime Organization (IMO) MARPOL Annex VI, which came into force in May 2005, set new international NO_x emission limits on marine engines in 1997. They apply to engines over 130 kilowatts (kW) installed on new vessels retroactive to the year 2000. In April 2008, the Marine Environment Projection Committee of the IMO approved a recommendation for new MARPOL Annex VI sulfur limits for fuel and NO_x limits for engines. In October 2008 the IMO adopted these amendments under MARPOL Annex VI which place a global limit on marine fuel sulfur content of 3.5 percent by 2012 and reduce it to 0.5 percent sulfur by 2020 or 2025 pending a technical review in 2018. On July 21, 2008 the U.S. signed the Maritime Pollution Protection Act of 2008, ratifying MARPOL Annex VI and the requirements became enforceable in January 2009.

On March 26, 2010 the IMO amended MARPOL designating specific portions of U.S. waters including the Pacific coast as an Emission Control Area (ECA) (IMO 2008). The requirements for an ECA include a limitation of marine fuel sulfur content to 1 percent by 2010 and 0.1 percent by 2015. The emission estimates for the PMPU operations assume that all ships calling at the Port would comply with the MARPOL Annex VI sulfur fuel limits.

An ECA also requires that, starting in 2016, engines in new built ships have to comply with Tier III standards (after treatment-forcing) to reduce NO_x emissions. The amended NO_x engine standards for ocean-going vessels (OGVs) 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). These standards will dramatically reduce air pollution from ships and deliver substantial air quality and public health benefits that could extend hundreds of miles inland. In 2020, USEPA expects emissions from ships that operate in the ECAs to decrease by 320,000 tons for NO_x, 90,000 tons for $PM_{2.5}$, and 920,000 tons for SO_x, compared to operations based upon the global standards; and,
2. The global engine emission standards are 1) Tier 2 for new engines (20 percent NO_x reduction which began in January 2011) and 2) Tier 1 for existing engines, or equal to those adopted by USEPA 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 5 years.

3.2.3.2 Federal Regulations

3.2.3.2.1 State Implementation Plan

For areas that do not attain a NAAQS, the CAA requires preparation of a State Implementation Plan (SIP), detailing how the state will attain the NAAQS within mandated timeframes. In response to this requirement, the SCAQMD and Southern California Association of Governments (SCAG) have periodically developed air quality management plans (AQMPs) for the SCAB. The SCAQMD, in cooperation with SCAG and CARB, most recently developed the 2012 AQMP for purposes of demonstrating compliance with the national standards for $PM_{2.5}$, PM_{10}, 8-hour O_3, and the 1-hour O_3 national standard revoked by the USEPA (SCAQMD 2012b). The SCAQMD Governing Board adopted the 2012 AQMP as final on December 7, 2012 (SCAQMD 2013).

The 2012 AQMP identifies all feasible emission control strategies needed to bring the SCAB into attainment with the national $PM_{2.5}$ standard by 2014 and the 1-hour ozone standard by 2022. The 2012 AQMP also updates the federally-approved 8-hour O_3 SIP outlined in the 2007 AQMP with new measures to demonstrate attainment of this standard by 2023. These additional emissions reductions also are needed to demonstrate attainment with the revoked 1-hour ozone standard. The 2012 AQMP includes control measure IND-01, the Port Backstop Measure. This measure requires development of a regulation that would take effect if the Port and the Port of Long Beach fail to meet emission reduction targets needed to achieve the national $PM_{2.5}$ standard by 2014. If this were to happen, the regulation would require the Ports to develop additional emission control measures to address this shortfall.

3.2.3.2.2 Emissions Standards for Marine Diesel Engines

To reduce emissions from Category 1 (at least 50 horsepower [hp] but less than 5 liters per cylinder displacement) and Category 2 (5 to 30 liters per cylinder displacement) marine diesel engines, USEPA established Tier 2 emission standards for new engines in 1999. The Tier 2 standards were phased in from 2004 to 2007 (year of manufacture), depending on the engine size.

On March 14, 2008, USEPA finalized a program to reduce emissions from marine diesel engines above 800 hp and below 30 liters per cylinder displacement. The regulation introduces new Tier 3 and Tier 4 standards which apply to both new and remanufactured diesel engines. Tier 3 standards apply to new engines used in commercial, recreation, and auxiliary marine power applications beginning in 2009 for Category 1 engines and in 2013 for Category 2 engines. Tier 4 standards apply to new Category 1 and 2 engines above 600 kW on commercial vessels beginning in 2014. For remanufactured engines, standards apply only to commercial marine diesel engines above 600 kW when the engines are remanufactured and as soon as certified systems are available. The new Tier 4 standards will reduce emissions of DPM by 90 percent and NO_x by 80 percent from marine diesel engines, compared to engines with Tier 2 standards (USEPA 2008). The air quality analysis in the PEIR assumes that this rule would affect harbor craft but not OGV auxiliary engines, as the latter would likely be manufactured overseas and therefore would not be subject to the rule.

3.2.3.2.3 Control of Emissions from New Marine Compression-Ignition Engines at or above 30 Liters per Cylinder

In January 2003, USEPA adopted Tier 1 NO_x standards for marine diesel engines above 30 liters per cylinder (Category 3, marine propulsion engines on OGVs). The standards went into effect for new engines built in 2004 and later. The Tier 1 limits were achieved by engine-based controls, without the need for exhaust gas after treatment.

On April 30, 2010, USEPA finalized emission standards for Category 3 marine diesel engines installed on U.S.-flagged vessels as well as marine fuel sulfur limits which are equivalent to the amendments recently adapted to MARPOL Annex VI (USEPA 2010a). The final regulation established stricter standards for NO_x and added standards for hydrocarbons and CO. Tier 2 NO_x standards for newly built engines apply beginning in 2011 and Tier 3 standards will apply beginning in 2016 in ECAs. The NO_x limit for Tier 2 engines in 2011 was 1) 14.4 grams per kilowatt-hour (g/kW-hr) for engines less than 130 revolutions per minute (RPM); 2) determined by engine RPM rating for engines between 130 RPM and 2,000 RPM; and, 3) 7.7 g/kW-hr for engines over 2,000 RPM. Tier 3 engines in 2016 must meet 1) a NO_x limit of 3.4 g/kW-hr for engines less than 130 RPM, 2) a NO_x standard determined by engine RPM rating for engines between 130 RPM and 2,000 RPM, and 3) a NO_x limit of 2.0 g/kW-hr for engines over 2,000 RPM. In addition, sulfur fuel limits for ECAs are 10,000 ppm in 2012 and 1,000 ppm in 2020. The final rule became effective on June 29, 2010.

3.2.3.2.4 Emission Standards for Nonroad Diesel Engines

To reduce emissions from nonroad diesel equipment, USEPA established a series of increasingly strict emission standards for new nonroad diesel engines, culminating in the Tier 4 Final Rule of June 2004. Tier 1 standards were phased in on newly manufactured equipment from 1996 through 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in on newly manufactured equipment from 2001 through 2006. Tier 3 standards were phased in on newly manufactured equipment from 2006 through 2008. Tier 4 standards, which require advanced emission control technology to attain them, are being phased in between 2008 to 2015. These standards apply to construction equipment and cargo handling equipment (CHE). The Tier 4 standards complement the 2007 and later on-road heavy-duty engine standards by requiring 90 percent reductions in DPM and NO_x when compared to current emission standards. To meet the Tier 4 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 began with smaller engines in 2008 and will culminate when all but the very largest diesel engines meet NO_x and PM standards in 2015.

3.2.3.2.5 Emission Standards for Locomotives

To reduce emissions from switch and line-haul locomotives, USEPA established a series of increasingly strict emission standards for new or remanufactured locomotive engines. Tier 0 standards applied to engines manufactured or remanufactured from

1973 to 2001. Tier 1 standards applied to engines manufactured/remanufactured from 2002 to 2004. Tier 2 standards applied to engines manufactured/ remanufactured after 2004. A regulation signed on March 14, 2008, introduced more stringent emission requirements: Tier 3 standards, to be met by engine design methods, are effective between 2011 and 2012. Tier 4 standards, which are expected to require exhaust gas after-treatment technologies, become effective starting in 2015. The 2008 regulation also includes more stringent emission standards for remanufactured Tier 0, Tier 1, and Tier 2 locomotive engines (DieselNet 2011).

3.2.3.2.6 Emission Standards for On-Road Trucks

To reduce emissions from on-road, heavy-duty diesel trucks, USEPA established a series of increasingly strict emission standards for new engines, starting in 1988. Table 3.2-7 summarizes the non-methane hydrocarbon (NMHC), NMHC+NO_x, NO_x, and PM emission standards (in g/bhp-hr) that have been promulgated through the years. The NO_x and NMHC limits for 2007 and newer engines were phased in together between 2007 and 2010 on a percent of sales basis of newly manufactured engines: 50 percent from 2007 to 2009 and 100 percent in 2010.

Table 3.2-7. USEPA Emission Standards for Heavy-Duty Diesel Engines (g/bhp-hr)

Model Year	*NMHC*	*NMHC+NO_x*	*NO_x*	*PM*
1988	--	--	10.7	0.60
1990	--	--	6.0	0.60
1991	--	--	5.0	0.25
1994	--	--	5.0	0.10
1998	--	--	4.0	0.10
2004 and later *Option 1*	--	2.4	--	0.10
Option 2	0.5	2.5	--	0.10
2007 and later	0.14	--	0.20	0.10
Source: LAHD AND USACE 2012				

3.2.3.2.7 Nonroad Diesel Fuel Rule

Under this rule, in May 2004, USEPA set sulfur content limits for nonroad diesel fuel, including locomotives and marine vessels (excluding marine residual fuel used by OGVs). For the proposed Program, this rule affects line-haul locomotives; the California Diesel Fuel Regulations (described below) generally preempt this rule for other sources such as yard locomotives, construction equipment, terminal equipment, and harbor craft. Under this rule, diesel fuel used by line-haul locomotives was limited to 500 ppm starting June 1, 2007 and it was further limited to 15 ppm starting January 1, 2012 (USEPA 2004).

3.2.3.2.8 Heavy-Duty Highway Diesel Fuel Rule

Under this rule (also known as the "2007 Highway Rule"), in 2001, USEPA set sulfur content limits for on-road diesel fuel used in heavy-duty trucks and buses to 15 ppm starting June 1, 2006 (USEPA 2006).

3.2.3.2.9 General Conformity Rule

Section 176(c) of the CAA states that a federal agency cannot support an activity unless the agency determines that the activity will conform to the most recent USEPA-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 NAAQS attainment status of the SCAB, a federal action would conform to the SIP if its annual emissions remain below 100 tons of CO or $PM_{2.5}$ (or any of the $PM_{2.5}$ precursors: NO_x, SO_x, VOCs or ammonia), 70 tons of PM_{10}, or 10 tons of NO_x or VOC. If the proposed action exceeds one or more of these *de minimis* thresholds, the federal agency must perform a conformity determination to demonstrate that the proposed action would conform to the SIP. In the SCAB, SCAQMD Rule 1901 promulgates the general conformity rule.

Approval of the PMPU and certification of this PEIR is not contingent on approval from a federal agency. Therefore, the general conformity rule does not apply to this action. However, the proposed appealable/fill projects under the PMPU that include in-water construction would require approvals from federal agencies, such as the USACE. Prior to final approval, the USACE would have to demonstrate that the federal proposed action would comply with the general conformity rule to ensure that it would conform to the applicable SIP.

3.2.3.2.10 GHG Endangerment Finding and Light-Duty Vehicle Rule

The U.S. Supreme Court ruled that the harms associated with climate change are serious and well recognized, that the USEPA must regulate GHGs as pollutants, and unless the agency determines that GHGs do not contribute to climate change, it must promulgate regulations for GHG emissions from new motor vehicles (Massachusetts et al. v. USEPA et al. [case No. 05-1120], 2007). In response, in December 2009 the USEPA released an ”endangerment finding” which found that current and projected levels of six GHGs threaten the health and human welfare of current and future generations (USEPA 2009a).

As required by the Supreme Court ruling, on May 7, 2010 the USEPA in conjunction with the U.S. Department of Transportation’s (USDOT’s) National Highway Traffic Safety Administration finalized the Light-Duty Vehicle Rule that establishes a national program consisting of GHG emissions standards and Corporate Average Fuel Economy standards for light-duty vehicles. Light-Duty Vehicle Rule standards first apply to new cars and trucks starting with model year (MY) 2012. This rule will reduce both GHG emissions and criteria pollutant emissions beginning in 2012.

The complementary USEPA and National Highway Traffic Safety Administration standards that make up the heavy-duty national program were promulgated in August 2011. The standards apply to combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks).

3.2.3.2.11 Prevention of Significant Deterioration/Title V Tailoring Rule

On May 13, 2010 the USEPA finalized the *Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule* (Tailoring Rule) that requires new facilities that emit over 100,000 tons of GHGs per year or modifications to facilities that increase GHG emissions by over 75,000 tons per year to obtain permits that would demonstrate they are using the best practices and technologies to minimize GHG emissions (USEPA 2012a). The permitting requirements under the Tailoring Rule went into effect on January 2, 2011.

3.2.3.2.12 Mandatory GHG Reporting Rule

To evaluate the sources of GHG emissions in the U.S. economy, the USEPA finalized a GHG Mandatory Reporting Rule on December 29, 2009 (USEPA 2009b). The Rule covers suppliers of fossil fuels and industrial GHGs, manufacturers of vehicles and engines, and facilities that emit over 25,000 metric tons of GHGs per year. The first emissions reports from covered facilities were due on September 30, 2011 for calendar year 2010 emissions. Information collected from this rule is expected to be used to inform future policy decisions.

3.2.3.2.13 Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 was signed into law on December 19, 2007, and includes provisions covering:

- Renewable Fuel Standard (Section 202);
- Appliance and Lighting Efficiency Standards (Sections 301–325); and,
- Building Energy Efficiency (Sections 411–441).

Additional provisions of the Energy Independence and Security Act address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs." The Renewable Fuel Standard requires annual increases in biofuels sold (both biodiesel and bioethanol) from 2010 to 2022. By 2022, the Standard will require at least 74 billion gallons of biofuel to be sold in the U.S. (approximately 14.5 billion gallons were sold in 2010).

3.2.3.3 State Regulations

3.2.3.3.1 California Clean Air Act

The California Clean Air Act of 1988, as amended in 1992, outlines a program to attain the CAAQS by the earliest practical date. Because the CAAQS are more stringent than the NAAQS, attainment of the CAAQS will require more emissions reductions than what would be required to show attainment of the NAAQS. Consequently, the main focus of attainment planning in California has shifted from the federal to state requirements. Similar to the federal system, the state requirements

and compliance dates are based upon the severity of the ambient air quality standard violation within a region.

3.2.3.3.2 Assembly Bill 2650

AB 2650 (Lowenthal) was signed into law by Governor Davis and 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 Los Angeles, Long Beach, and Oakland, or face fines of $250 per violation. Collected fines are to 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 approved in September 2004 to ensure that the intent of AB 2650 is not circumvented by moving trucks with appointments inside terminal gates while they wait.

3.2.3.3.3 Heavy-Duty Diesel Truck Idling Regulation

This CARB rule affects heavy-duty diesel trucks in California beginning in 2008. The rule requires that heavy-duty trucks be equipped with a non-programmable engine shutdown system that shuts down the engine after 5 minutes of idling or optionally meet a stringent NO_x idling emission standard.

3.2.3.3.4 1998 South Coast Locomotive Emissions Agreement

CARB, Class I freight railroads operating in the SCAB (Burlington Northern and Santa Fe [BNSF] and Union Pacific Railroad [UP]), and USEPA signed the 1998 Memorandum of Understanding (MOU), agreeing to a locomotive fleet average emissions program in the SCAQMD. The 1998 MOU required that, by 2010, the Class I freight railroad fleet of locomotives in the SCAQMD achieve average emissions equivalent to the NO_x emission standard established by USEPA for Tier 2 locomotives (5.5 g/bhp-hr). The MOU applies to both line-haul (freight) and switch locomotives operated by the railroads. This emission level is equivalent, on average district-wide, to operating only federal Tier 2 NO_x-compliant locomotives in the SCAQMD (CARB 2005a). Since this MOU applies to locomotives on an average district-wide basis, it was not considered as a proposed Program component or mitigation measure in this Draft PEIR.

3.2.3.3.5 2005 CARB/Railroad Statewide Agreement

In 2005, the CARB, Class I freight railroads operating in the SCAB (BNSF and UP), and USEPA signed the 2005 MOU, agreeing to several program elements intended to reduce the emission impacts of rail-yard operations on local communities. The 2005 MOU includes a locomotive idling-reduction program, early introduction of lower-sulfur diesel fuel in interstate locomotives, and a visible emission reduction and repair program (CARB 2005a).

3.2.3.3.6 Airborne Toxic Control Measure for Commercial Harbor Craft

With this rule, CARB set requirements for low sulfur fuel and newly acquired harbor craft and set compliance dates by which owners and operators of commercial harbor craft are required to replace or otherwise bring into compliance with the specified engine standards all in-use pre-Tier 1 and Tier 1-certified engines. The compliance dates are designed to clean up the fleet's oldest and dirtiest engines first, while giving more time for relatively newer, Tier 1 engines to be upgraded or replaced.

3.2.3.3.7 California Diesel Fuel Regulations

With this rule, the CARB set sulfur content limits for diesel fuel sold in California for use in on-road and off-road motor vehicles (Title 13, CCR, Sections 2281-2285; Title 17, CCR, Section 93114). Harbor craft and intrastate locomotives were originally excluded from the rule, but were later included by a 2004 rule amendment (CARB 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 on September 1, 2006. The federal nonroad diesel fuel rule similarly limited sulfur content nationwide to 15 ppm by October 15, 2006. Diesel fuel used in harbor craft in the SCAQMD was limited to 500 ppm sulfur starting January 1, 2006 and 15 ppm sulfur starting September 1, 2006. Diesel fuel used in intrastate locomotives (switch locomotives) was limited to 15 ppm sulfur starting January 1, 2007.

3.2.3.3.8 CARB In-Use Off-Road Diesel Vehicle Rule

In July 2007, CARB adopted a rule that requires owners of off-road mobile equipment powered by diesel engines 25 hp or larger to meet the fleet average or BACT requirements for NO_x and PM emissions by March 1 of each year (CARB 2008a). The rule is structured by fleet size: large; medium; and small. Medium sized fleets receive deferred compliance, and small fleets are exempt from NO_x requirements and also get deferred compliance. In 2011, CARB amended the regulation to delay the turnover of Tier 1 equipment for meeting the NO_x performance requirements of the regulation, and then to delay overall implementation of the equipment turnover compliance schedule in response to the economic downturn in 2008 and 2009. The regulation also limits idling of off-road vehicles to 5 minutes.

3.2.3.3.9 Measures to Reduce Emissions from Goods Movement Activities

Emission Reduction Plan for Ports and Goods Movement in California

In April 2006, CARB approved the *Emission Reduction Plan for Ports and Goods Movement in California* (CARB 2006b). 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 effort is also the next step in implementing the *Goods Movement Action Plan* developed by the California Business, Transportation and Housing Agency and the CalEPA. The final *Goods Movement Action Plan* was released on January 11, 2007, and includes measures to address the various layers of the goods movement system throughout the state including freeways, rail, and ports.

Fuel Sulfur Regulation for Ocean-Going Vessels

The CARB approved an updated version of the 2009 *Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline* in 2011. This Fuel Sulfur Regulation for OGV is designed such that it does not require USEPA authorization. The fuel requirements in the regulation apply to OGV main (propulsion) diesel engines, auxiliary diesel engines, and auxiliary boilers when OGV are traveling and operating within 24 nm of the California coastline. Vessel owners/operators are required to use the marine distillate fuels based on a phased approach. The Phase I fuel requirements of July 1, 2009 allow the use of marine gas oil up to 1.5 percent sulfur or marine diesel oil up to 0.5 percent sulfur. Under Phase II, which becomes effective on January 1, 2014, vessels are limited to the use of diesel fuels that do not exceed 0.1 percent sulfur, in line with the North American ECA requirements.

Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards

In December 2006, CARB approved the Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards (Title 13, CCR, Section 2479), which is designed to use BACT to reduce DPM and NO_x emissions from mobile CHE at ports and intermodal rail yards. Since January 1, 2007, the regulation has imposed emission performance standards on new and in-use terminal equipment that vary by equipment type. The regulation also includes recordkeeping and reporting requirements. On September 22, 2011, the CARB approved amendments to the CHE Regulation that provide additional flexibility to owners/operators in an effort to reduce compliance costs and to maintain the anticipated emissions reduction benefits of the regulation. The amendments to the regulation became effective on October 14, 2012. The effects of this regulation are accounted for in the unmitigated emission factors used in this study.

3.2.3.3.10 CARB Statewide Bus and Truck Regulation

In December 2008, CARB adopted the Statewide Bus and Truck Regulation requiring installation of PM retrofits on all heavy-duty trucks beginning January 1, 2012, and replacement of older trucks starting January 1, 2015. By January 1, 2023, all vehicles need to have 2010 MY engines or equivalent.

3.2.3.3.11 California Drayage Truck Regulation

CARB adopted a drayage truck regulation effective December 3, 2009 to reduce emissions and public exposure to DPM, NO_x, and other air contaminants that apply to

trucks transporting cargo to and from California's ports and intermodal rail facilities. Emergency vehicles and yard trucks are exempted from this regulation. The following requirements are phased in starting in 2009.

1) By December 31, 2009, all drayage trucks were required to be equipped with a 1994- 2003 MY engine certified to California or federal emission standards and a level 3 VDECS for PM emissions; or 2004 or newer MY engine certified to California or federal emission standards; or 1994 or newer MY engine that meets or exceeds 2007 MY state or federal standards.
2) After December 31, 2012, all drayage trucks with 2005-2006 MY engines must be equipped with the highest level VDECS for PM emissions.
3) After December 31, 2014, all drayage trucks must be equipped with a 1994 or newer MY engine that meets or exceeds 2007 MY state or federal standards.

3.2.3.3.12 At-Berth Ocean-Going Vessels

On December 6, 2007, CARB approved the California Port Regulations for At-Berth Ocean-Going Vessels (Title 13, CCR, Section 2299.3), which requires operators of container, passenger, and refrigerated cargo vessels meeting specified criteria to turn off auxiliary engines for most of their stay in port. For terminals that are providing electrical power from the electrical grid (such as the AMP program established by the Port), the regulation requires ship fleets to reduce NO_x and PM emissions from auxiliary engines while at berth by 50 percent starting January 1, 2014, 70 percent in 2017 and 80 percent starting January 1, 2020. This regulation was approved by the California Office of Administrative Law on December 3, 2008 and took effect on January 2, 2009. Therefore the effects of this regulation are assumed in the unmitigated emission calculations for future container operations under the PMPU.

3.2.3.3.13 Statewide Portable Equipment Registration Program

The Statewide Portable Equipment Registration Program (PERP) establishes a uniform program to regulate portable engines and portable engine-driven equipment units (CARB 2012b). Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts. The PERP generally would apply to construction-related equipment (e.g., dredging and barge equipment).

3.2.3.3.14 Assembly Bill 2588 – Air Toxics "Hot Spots" Information and Assessment Act

AB 2588 program provides information to state and local agencies and the public on the extent of airborne TACs released by stationary sources and the potential public health impacts of those emissions. The "Hot Spots" Act requires OEHHA to develop risk assessment guidelines for the "Hot Spots" Program that includes a "likelihood of risks" approach. The "Hot Spots" Act requires stationary sources of TACs to prepare facility-wide HRAs in accordance with OEHHA guidelines and to notify the public in the event of a potential health risk. In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731 which required facilities that pose a significant

health risk to the community to reduce their risk through a risk management plan (RMP).

3.2.3.3.15 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases

AB 1493 (Pavley), enacted on July 22, 2002 and amended on September 24, 2009, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB will apply to 2009 MY and later vehicles. The USEPA granted California the authority to implement GHG emission reduction standards for new passenger cars, pick-up trucks, and sport utility vehicles on June 30, 2009. The Pavley regulations are expected to reduce GHG emissions from these sources by 22 percent in 2012 and 30 percent in 2016.

3.2.3.3.16 Executive Order S-3-05

Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order (EO) S-3-05, statewide GHG emission reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. Some literature equates these reductions to 11 percent by 2010 and 25 percent by 2020.

3.2.3.3.17 Assembly Bill 32 – California Global Warming Solutions Act of 2006

On September 27, 2006, AB 32, the California Global Warming Solutions Act, of 2006 was enacted by the State of California. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (AB 32). AB 32 directs the state to reduce California emissions of GHGs to 1990 levels by 2020. This agreement represents the first enforceable state-wide program in the U.S. to cap GHG emissions. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generation facilities located outside the state that serve California residents and businesses (California Air Pollution Controls Officers Association 2008).

AB 32 directs the CARB to establish a program of regulatory and market mechanisms to achieve GHG reductions and to implement a mandatory GHG emissions reporting and verification program. AB 32 requires the CARB to finalize GHG emission limits and reduction measures by January 1, 2011 and to implement them by January 1, 2012.

In accordance with AB 32, the CARB approved the *Climate Change Scoping Plan* (Scoping Plan) in October 2008, which outlines the state's strategy for achieving the 2020 GHG emissions limit outlined under the law (CARB 2008b). The Scoping Plan includes 39 recommended actions that would reduce GHG emissions with the use of direct regulations, alternative compliance mechanisms, monetary and non-monetary

incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. In addition, the Scoping Plan identifies challenges to meeting future electrical demand, including building transmission lines for sources of renewable energy and modernizing electricity infrastructure.

Due to litigation, the Superior Court in San Francisco on January 24, 2011 issued a tentative ruling that the CARB did not provide adequate CEQA documentation for implementation of the Scoping Plan. The plaintiffs in the case claimed that CARB failed to adequately consider alternatives to the policies selected in the Scoping Plan, especially cap and trade. The CARB subsequently provided the needed CEQA analyses in a supplement to the Functional Equivalent Document of the Scoping Plan and then re-approved the Proposed Scoping Plan on August 24, 2011.

3.2.3.3.18 Executive Order S-01-07

EO S-01-07 was signed by the Governor on January 18, 2007. Essentially, the order mandates that 1) a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 and 2) that a low carbon fuel standard for transportation fuels be established for California.

CARB established a low carbon fuel standard on January 18, 2007 which calls for a reduction of at least 31 percent in the carbon intensity of California's transportation fuels by 2020. CARB adopted the final regulation on November 25, 2009 and the regulation became effective January 12, 2010. Reporting and recordkeeping requirements are required starting in 2010 and carbon intensity standards go into effect in 2011.

3.2.3.3.19 Senate Bill 1368 Greenhouse Gas Standard for Electrical Generation

SB 1368 authorizes the California Public Utilities Commission (CPUC), in consultations with the California Energy Commission and CARB, to establish GHG emissions standards for baseload generation for investor owned utilities. It requires the California Energy Commission to adopt a similar standard for local publicly owned or municipal utilities. This 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 1,100 pounds per megawatt hour. The CPUC adopted rulemaking implementing the legislation in January 2007. The California Energy Commission adopted rulemaking establishing a performance standard for baseload generation facilities in early 2007.

3.2.3.3.20 Renewable Portfolio Standard/Renewable Electricity Standard

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California's Renewable Portfolio Standard is one of the most ambitious renewable energy standards in the country. The Renewable Portfolio Standard program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at

least 1 percent of their retail sales annually, until they reach 20 percent by 2010. Under Governor Schwarzenegger, CARB was directed (EO S-21-09) to adopt a regulation by July 31, 2010, requiring the state's load serving entities to meet a 33 percent renewable energy target by 2020. CARB may consider different approaches that would achieve the objectives of the EO. This could include increasing the target and accelerating and expanding the time frame based on a thorough assessment of technical feasibility, system reliability, cost, GHG emissions, environmental protection, and other relevant factors. The EO commits CARB staff to work with the CPUC, the California Energy Commission, the California Independent System Operators and others in the development of the regulation. A Renewable Electricity Standard to achieve these goals was approved by CARB on September 23, 2010. The final regulation has not been published at this time.

3.2.3.3.21 Senate Bill 97

SB 97 required the Office of Planning and Research (OPR) to prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The Natural Resources Agency adopted amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the amendments and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

3.2.3.3.22 Attorney General Greenhouse Gas CEQA Guidance Memo

Although not considered a regulation, the California State Attorney General's Office released a CEQA guidance memo related to GHG analysis and mitigation measures in 2008, and last revised in 2010 (California State Attorney General's Office 2010). The memo provides examples of mitigation measures that could be used in a diverse range of projects. Measures identified in the memo have been incorporated, to the extent feasible, as GHG mitigation measures in this analysis.

3.2.3.3.23 Office of Planning and Research's CEQA Guidelines on GHGs

OPR developed amendments to the CEQA Guidelines for addressing GHG emissions. These amendments became effective on March 18, 2010, when the Office of Administrative Law approved them. OPR did not define or set a CEQA threshold over which GHG emissions would be considered significant. Instead the lead agency would assess the significance of impacts from GHG emissions on the environment by considering a threshold that applies to the project and evaluate feasible mitigation measures. In addition, projects will be assessed as to whether they conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. OPR allows lead agencies to exercise discretion and make their own determinations of significance.

3.2.3.3.24 California Climate Action Registry/The Climate Registry

Established by the California Legislature in 2000, the CCAR was a nonprofit public-private partnership that maintained a voluntary registry for GHG emissions. CCAR transitioned into two programs in 2009, the Climate Action Reserve and TCR. The Climate Action Reserve tracks and registers voluntary projects that reduce emissions of GHGs. TCR has taken over the voluntary registry for GHG emissions from CCAR. The purpose of TCR is to help companies, organizations, and local agencies establish GHG emissions baselines for purposes of complying with future GHG emission reduction requirements. The Port was a voluntary member of CCAR, is now a member of TCR, and has made the following commitments:

- Identify sources of GHG emissions including direct emissions from vehicles, onsite combustion, fugitive and process emissions; and indirect emissions from electricity, steam and co-generation;
- Calculate GHG emissions using methods developed by the CCAR and TCR (TCR 2012); and,
- Report final GHG emissions estimates on the Registry website.

LAHD joined CCAR in March 2006. The Port also became a founding member of TCR in March 2008.

3.2.3.4 Regional and Local Regulations and Plans

3.2.3.4.1 South Coast Air Quality Management District Rules and Regulations

The SCAQMD is primarily responsible for planning, implementing, and enforcing the national and state ambient standards within the SCAB. The SCAQMD is also responsible for permitting and controlling stationary sources of criteria pollutants and air toxics, as delegated by the USEPA. Through these directives, the SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB (SCAQMD 2012c). The SCAQMD rules most pertinent to the PMPU are listed below.

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. This rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the emission source property line. During proposed construction activities, best available control measures identified in the rule would be required to minimize fugitive dust emissions from sources such as earth-moving and material handling. These measures would include site watering as necessary to maintain

sufficient soil moisture content. Additional requirements apply to construction projects on 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 cubic yards 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.

Rule 1113 – Architectural Coatings. This rule limits the VOC content of architectural coatings used within the SCAQMD.

Regulation XIII – New Source Review. This regulation sets forth pre-construction review requirements for new, modified, or relocated facilities, to ensure that the operation of such facilities does not interfere with progress in attainment of the NAAQS, and that future economic growth within the SCAQMD is not unnecessarily restricted. The specific air quality goal of this regulation is to achieve no net increases from new or modified permitted sources of nonattainment air contaminants or their precursors.

In addition to nonattainment air contaminants, this regulation will also limit emission increases of ammonia and O_3-Depleting Compounds from new, modified or relocated facilities by requiring the use of BACT.

Regulation XIV – Toxics and Other Non-Criteria Pollutants. This rule specifies limits for maximum individual cancer risk, cancer burden, and non-cancer acute and chronic hazard index from new permit units, relocations, or modifications to existing permit units which emit TACs. The rule establishes allowable risks for permit units requiring new permits.

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 people to notify the SCAQMD 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 the PMPU would need to comply with the requirements of Rule 1403.

3.2.3.4.2 Port/Port of Long Beach Vessel Speed Reduction Program

Under this program, the LAHD has requested that ships coming into the Port reduce their speed to 12 knots or less within 20 nm of the Point Fermin Lighthouse. This reduction of 3 to 10 knots per ship (depending on the ship's cruising speed) can substantially reduce emissions from the main propulsion engines of the ships. The program started in May 2001. In 2006, the CAAP adopted the VSRP as control measure OGV1 and expanded it out to 40 nm from the Point Fermin Lighthouse.

3.2.3.4.3 San Pedro Bay Ports Clean Air Action Plan

The Port and the Port of Long Beach, with the participation and cooperation of the staff of the USEPA, CARB and SCAQMD, adopted the CAAP in November 2006. This planning and policy document sets goals and implementation strategies to reduce air emissions and health risks associated with port operations while accommodating growth in trade (Port and Port of Long Beach 2006). The CAAP sought the reduction of criteria pollutant emissions to levels that assure port-related sources decrease their "fair share" of regional emissions to enable the SCAB to attain the ambient air quality standards. The ports measure progress towards achieving its initiatives with the use of air monitoring and annual Port-wide emission inventories.

Each individual CAAP measure is a proposed strategy for achieving these emissions reductions goals. Specific strategies to significantly reduce the health risks posed by air pollution from port-related sources include:

- Aggressive milestones with measurable goals for air quality improvements;
- Specific goals set forth as standards for individual source categories to act as a guide for decision-making;
- Recommendations to eliminate emissions of UFPs;
- Technology advancement programs to reduce GHGs; and,
- Public participation processes with environmental organizations and the business communities.

The CAAP focuses primarily on reducing DPM, along with NO_x and SO_x. This reduces emissions and health risk and thereby allows for future port growth while progressively controlling the impacts associated with growth. The CAAP includes emission control measures as proposed strategies that are designed to further these goals expressed as Source-Specific Performance Standards which may be implemented through the environmental review process, or could be included in new leases or Port-wide tariffs, MOU, voluntary action, grants or incentive programs.

On November 22, 2010, the ports adopted the CAAP 2010 Update (CAAP Update or CAAP). The CAAP Update proposed new emission control measures which support the goals expressed as the Source-Specific Performance Standards and the Project-Specific Standards. In addition, the CAAP Update includes the recently developed San Pedro Bay Standards which establish emission and health risk reduction goals to assist the ports in their planning for adopting and implementing strategies to significantly reduce the effects of cumulative port-related operations (Port and Port of Long Beach 2010).

The goals set forth as the San Pedro Bay Standards are the most significant addition to the CAAP and include both a Bay-wide health risk reduction standard and a Bay-wide mass emission reduction standard. Ongoing Port-wide CAAP progress and effectiveness will be measured against these Bay-wide Standards which consist of the following reductions as compared to 2005 emissions levels.

- Health Risk Reduction Standard: 85 percent reduction in DPM by 2020.

- Emission Reduction Standards:
  - By 2014, reduce emissions by 72 percent for DPM, 22 percent for NO_x, and 93 percent for SO_x; and,
  - By 2023, reduce emissions by 77 percent for DPM, 59 percent for NO_x, and 92 percent for SO_x.

The Project-Specific Standard remains as adopted in the original CAAP in 2006, that new projects meet the 10 in 1,000,000 excess residential cancer risk threshold, as determined by HRAs conducted subject to CEQA statutes, regulations and guidelines, and implemented through required CEQA mitigations and/or lease negotiations. Although each port has adopted the Project-Specific Standard as a policy, the Boards of Harbor Commissioners retain the discretion to consider and approve projects that exceed this threshold if the Board deems it necessary by adoption of a statement of overriding considerations at the time of project approval.

The CAAP identified source-specific emission controls measures for OGVs, trains, trucks, CHE, and harbor craft. The CAAP Update revises several of these emission control measures and proposes new measures.

While the Port has adopted a general policy that its leases shall be compliant with the CAAP, the Board has discretion regarding the form of all lease provisions and CAAP measures at the time of lease approval. In addition, tenants must comply with all applicable federal, state, and local air quality regulations.

As the CAAP is a planning document that sets goals and implementation strategies to guide future actions, it does not constrain the discretion of the Ports' Boards of Harbor Commissioners as to any specific future action. Each individual CAAP measure is a proposed strategy for achieving necessary emission reductions. The Boards of Harbor Commissioners use their discretion in their approvals of projects, leases, tariffs, contracts, or other implementing activities in order to appropriately apply the CAAP to the particular situation, and may make adjustments if any proposed measure proves infeasible or if better alternatives for a measure emerge.

Port and Port Long Beach Clean Truck Program (CTP). The CTP is a central element of the CAAP. The CTP establishes a progressive ban on polluting trucks. As of October 1, 2008, all pre-1989 trucks were banned from the Port. As of January 1, 2010, all 1989-1993 trucks were banned from the Port in addition to 1994-2003 trucks that were not retrofitted. As of January 1, 2012, all trucks that do not meet the 2007 Federal Clean Truck Emissions Standards are banned from the Port. In the first year of the CTP, the program reduced the rate of Port truck emissions by an estimated 70 percent. Now that the program is fully implemented, Port truck emissions have been reduced by more than 80 percent. The analysis in this PEIR assumes that all future trucks under the PMPU would comply with the CTP.

Port and Port Long Beach Switch Locomotive Modernization. Pacific Harbor Line (PHL) entered into an agreement with the Port and the Port of Long Beach to replace its harbor locomotives with cleaner locomotives that either meet the Tier 2 standards or use alternative fuels. In addition, in 2011 all PHL locomotives were further upgraded and now exceed Tier 3 emission limits.

3.2.3.4.4 Port of Los Angeles Sustainable Construction Guidelines

In February 2008, the Board adopted the *Los Angeles Harbor Department Sustainable Construction Guidelines for Reducing Air Emissions* (Port Construction Guidelines) (updated in November 2009). These guidelines are used to establish air emission criteria for inclusion in construction bid specifications. The Port Construction Guidelines reinforce and require sustainability measures during performance of the contracts, balancing the need to protect the environment, be socially responsible, and provide for the economic development of the Port. Future Board resolutions will expand the Port Construction Guidelines to cover other aspects of construction, as well as planning and design. These guidelines support the forthcoming Port Sustainability Program.

The intent of the Port Construction Guidelines is to facilitate the integration of sustainable concepts and practices into all capital projects at the Port and to phase in the implementation of these procedures in a practical yet aggressive manner. Significant features of the Port Construction Guidelines include, but are not limited to, the following.

- All dredging equipment shall be electric.
- All ships and barges used primarily to deliver construction related materials for LAHD construction contracts shall comply with CAAP measure OGV1 (expanded VSRP).
- Harbor craft shall meet USEPA Tier 2 engine emission standards.
- All on-road heavy-duty trucks must meet the requirements of the CTP.
- Off-road construction equipment must meet Tier 3 standards in the period between 1/1/2012 to 12/31/2014 and Tier 4 standards after 1/1/2015.
- As applicable, off-road construction equipment shall be equipped with a CARB-verified Level 3 DECS.
- Construction equipment idling shall be limited to 5 minutes when not in use.
- There shall be full compliance with SCAQMD Rule 403, Fugitive Dust, including an approved Control Plan, if required.

All construction activities associated with the PMPU would adopt all applicable Sustainable Construction Guidelines as mitigations. These measures are incorporated into the mitigated emission calculations for the PMPU. Section 3.2.4.3, Impacts and Mitigation, identifies the mitigation and monitoring requirements for these measures.

3.2.3.4.5 Port of Los Angeles Green Building Policy

In 2007 LAHD adopted a Green Building Policy. The policy stipulated the following for the construction of new buildings 7,500 square feet or greater:

- Buildings meeting the intention set forth by LEED NC (i.e., office buildings) will be designed to a minimum standard of LEED NC Gold (U.S. Green Building Council 2009);

- Buildings of the typology that was not the primary focus for LEED NC (i.e., marine utilitarian buildings) will be designed to a minimum standard of LEED NC Silver (U.S. Green Building Council 2009);
- All LAHD-owned existing buildings 7,500 square feet or greater will be inventoried and evaluated for their applicability to LEED EB standards. The operation and maintenance procedures of the building will then be used to determine the priority for certification to LEED EB standards (U.S. Green Building Council 2008);
- All other buildings not encompassed in the above criteria will be designed and construction to comply or be consistent with the highest practical and applicable LEED standards or their equivalent to the extent feasible for the building's purpose; and,
- In addition to meeting LEED standards, all new Port buildings will incorporate solar power to the maximum feasible extent as well as incorporate the best available technology for energy and water efficiency.

The LAHD also will:

- Participate in the LADWP's New Construction Incentive Program utilizing the Performance Method or Prescriptive Method;
- Maintain a staff dedicated to the advancement of sustainable practices, with that staff developing green guidelines and sustainable strategies for Port developments, maintenance, and operations; and,
- Continuously evaluate their sustainable practices and maintain contact with existing city department organizations for the advancement of those practices.

3.2.3.4.6 City of Los Angeles Policies - Green LA Action Plan

The city released its climate action plan, *Green LA: An Action Plan to Lead the Nation in Fighting Global Warming*, in May 2007 (City of Los Angeles 2007). The Green LA Plan is a voluntary program that sets a goal of reducing the city's GHG emissions to 35 percent below 1990 levels by 2030. Climate LA is the implementation framework that contains the details of the more than 50 action items that are included in Green LA. The majority of the actions described in the Green LA Plan are not project-specific and include city-wide actions. Some of the measures the city will take to achieve the 35 percent reduction goal include the following:

- Increasing the amount of renewable energy provided by LADWP;
- Improving the energy efficiency of all city departments and city-owned buildings;
- Converting city fleet vehicles, refuse collection trucks, street sweepers and buses to alternative fuel vehicles;
- Providing incentives and assistance to existing LADWP customers in becoming more energy efficient;
- Changing transportation and land use patterns to reduce dependence on automobiles;

- Decreasing per capita water use;
- "Greening" the Port and the four airports operated by the city (including LAX and LA/Ontario International Airport); and,
- Promoting expansion of the "green economy" throughout the city.

The Green LA Plan calls for the following Port-specific actions:

- Fully implement the CAAP;
- Complete a strategic plan for the Port, including sustainable and green growth options; and,
- Complete an economic development plan for the Port, identifying opportunities to link the Port's investment in green growth to new economic opportunities in the green sector.

3.2.4 Impacts and Mitigation Measures

3.2.4.1 Methodology

The proposed appealable/fill projects under the proposed Program would result in a variety of construction and operational activities that would affect air quality within the PMPU area and surrounding region. The land use changes proposed under the PMPU also would allow for changes in potential development and operations within the Port. The timing and specific details of many of these activities are uncertain, as they are either unknown or in various stages of planning. However, reasonable assumptions were made to enable a general evaluation of their air quality impacts.

This PEIR estimates air quality impacts from the following actions that potentially would occur from the PMPU: 1) construction activities due to the proposed appealable/fill projects and land use changes and 2) operational activities based on the full build-out of the proposed appealable/fill projects and land use changes within the Port. The analysis for the PMPU planning horizon extends out to year 2035 (Section 2.5.5, Program Schedule). To define air emissions and impacts from these potential actions, this PEIR used analyses recently completed for projects and actions that are similar to those anticipated for the proposed Program, including those found in 1) LAHD CEQA/NEPA documents and 2) the Port 2011 Emissions Inventory. This surrogate approach is deemed adequate for defining programmatic-level air quality impacts in this PEIR. In addition, future CEQA documentation for individual actions included in the PMPU will provide detailed analyses, as appropriate, of project-specific air quality impacts.

The following section describes the methods used to characterize air quality impacts from the PMPU. To determine their significance, potential emissions and impacts predicted to occur within each planning area were evaluated in comparison to the significance criteria presented in Section 3.2.4.2, Thresholds of Significance, of this PEIR.

3.2.4.1.1 Determining Impacts from Construction Emissions

A variety of construction activities would occur in association with the PMPU. These construction activities would involve the use of off-road construction equipment (including land-side construction equipment and in-water equipment such as dredgers and pile drivers), on-road trucks, tugboats, general cargo ships used to deliver construction-related equipment, and worker vehicles. These sources primarily would use diesel fuel and would generate combustive emissions in the form of CO, VOCs, NO_x, SO_x, PM_{10}, and $PM_{2.5}$. In addition, off-road construction equipment traveling over unpaved surfaces and performing earthmoving activities such as site clearing or grading would generate fugitive dust emissions in the form of PM_{10} and $PM_{2.5}$. Worker commuter vehicles also would generate exhaust and paved road dust emissions.

The evaluation of air quality impacts from proposed construction focuses on two of the larger types of activities that would occur from the proposed Program: 1) landfill construction and 2) terminal/backlands development. These activities were chosen for analysis to be conservative, since they would produce relatively large amounts of daily emissions. Analysis of the significance of construction emissions typically focuses on a peak day to ensure identification of a maximum emissions scenario for comparison to the SCAQMD daily significance thresholds. Therefore, to analyze a conservative peak day scenario, this PEIR assumes that both of these large projects would occur during the same day. Inclusion of construction emissions from smaller types of construction projects would not make the analysis substantially more conservative.

Landfill Construction

The definition of daily emissions that would occur from potential landfill construction activities under the proposed Program are based on those estimated for construction of the 5-acre Northwest Slip landfill at the Berths 136-147 Container Terminal and an 8-acre landfill at the Berths 243-245 disposal site, as proposed for the Port's Channel Deepening Project (LAHD and USACE 2009). Both of these activities are presented as possible landfilling options that would occur under the PMPU, as they used somewhat different techniques resulting in somewhat different levels of air emissions: 1) the 5-acre Northwest Slip landfill used conventional dike and fill methods and 2) the 8-acre landfill at the Berths 243-245 disposal site used a confined dike and fill technique to sequester contaminated sediments. For this analysis, these two landfill techniques are referred to as general landfill and confined landfill, respectively. Larger landfill projects than these would occur under the proposed Program, such as the 18-acre landfill for Pier 300. However, it is expected that the daily emissions from either of these landfill activities would approximate daily emissions that could occur from any landfill construction action under the proposed Program.

Terminal Development

The definition of daily emissions that could occur from potential land-based construction activities under the proposed Program is based on those estimated for terminal development activities for the LAHD's Berths 302-306 (APL) Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012). These construction activities included 49 acres of backland improvements and paving on

new lands and improvements to the existing 291-acre facility that involved extension of an existing concrete wharf by 1,250 feet, crane installations, gate modifications, development of additional parking areas, and installation of infrastructure improvements. The air quality analysis for the Berths 302-306 Project determined that all of these activities would occur during a peak daily emissions scenario. The proposed Program would require most if not all of the terminal development activities identified for the Berths 302-306 Project at some point in the future. However, implementation of these activities under the proposed Program would occur at an irregular rate and over a longer period of time (several years) compared to the Berths 302-306 Project. Therefore, peak daily activities and resulting emissions from terminal development under the proposed Program would be somewhat less than the terminal development estimated for the Berths 302-306 Project.

Ambient Pollutant Impacts from Construction Activities

Given the programmatic nature of this PEIR, air dispersion modeling to estimate ambient pollutant concentrations from proposed construction is not possible as it requires project-level specific information regarding source geometries and locations. As such, this PEIR uses the results of the dispersion modeling analyses conducted for terminal development under the Berths 302-306 Project as indicators of ambient pollutant impacts that would occur from potential construction emissions under the proposed Program. This analysis was chosen, as it evaluated a higher emissions scenario and produced higher ambient pollutant impacts compared to the analysis of ambient air pollutant impacts for landfill construction under the Port's Channel Deepening Project (LAHD and USACE 2009).

It is expected that ambient pollutant impacts from construction activities under the proposed Program would be less than those identified for the Berths 302-306 Project. This is because the Berths 302-306 Project evaluated a large terminal development activity for one location at the Port, whereas future construction activities under the proposed Program would occur at smaller scales and several locations in the Port. In particular, the Berths 302-306 Project evaluated a scenario with a denser aerial distribution of emissions, which would result in higher localized ambient impacts compared to the more dispersed emissions scenario associated with the proposed Program.

The above analyses, used to approximate the ambient pollutant impacts from construction activities,under the proposed Program were performed using the most current 1) emission calculation methods, 2) source activity assumptions from the Port air emissions inventory process, and 3) applicable regulations and CAAP measures. Table 3.2-8 summarizes key regulations and agreements that were assumed in the calculations of unmitigated construction emissions.

Table 3.2-8. Regulations and Agreements Assumed in the Unmitigated Construction Emission Calculations

Off-Road Construction Equipment	*On-Road Trucks*	*Tugboats*	*General Cargo Ships*	*Fugitive Dust*
Emission Standards for Nonroad Diesel Engines - Tier 1, 2, 3, and 4 standards gradually phased in over all years due to normal construction equipment fleet turnover. **California Diesel Fuel Regulations** - 15-ppm sulfur. **CARB Portable Diesel-Fueled Engines Air Toxic Control Measure (ATCM)** - Effective September 12, 2007, all portable engines having a maximum rated horsepower of 50 bhp and greater and fueled with diesel shall meet weighted fleet average PM emission standards.	**Emission Standards for On-road Trucks** - Tiered standards gradually phased in over all years due to normal truck fleet turnover. **California Diesel Fuel Regulations** - 15-ppm sulfur. **Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling** - Diesel trucks are subject to idling limits, when not being used to power concrete mixing, water pumps, etc.	**California Diesel Fuel Regulations** - 15-ppm sulfur. From January 1, 2011 on: All harbor craft with C1 or C2 marine engines must utilize a USEPA Tier-3 engine, or cleaner.	**IMO Marpol VI** - 0.1 percent sulfur fuel **VSRP** – 100 percent compliance with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area. These ships must also use low-sulfur fuel (maximum sulfur content of 0.2 percent) in auxiliary engines, main engines, and boilers within 40 nm of Point Fermin.	**SCAQMD Rule 403 Compliance** - 60 percent reduction in fugitive dust due to watering three times per day. **SCAQMD Rule 1403 Compliance** - Work practices will limit asbestos emissions from demolition or renovations.
Note: This table lists key regulations and agreements that affect the emission calculations for the proposed Program.				

3.2.4.1.2 Determining Impacts from Operational Emissions

Operational activities associated with the proposed appealable/fill projects and land use changes under the PMPU would occur from essentially all types of cargo handling and transfer activities that exist at the Port today. Emission sources associated with these operations include OGVs, tugboats, terminal equipment, on-road trucks, trains, and stationary sources. As these sources are mainly diesel-powered, they would generate combustive emissions in the form of VOCs, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$. In addition, vehicles traveling over paved surfaces would generate fugitive dust emissions in the form of PM_{10} and $PM_{2.5}$. Worker commuter vehicles also would produce exhaust and paved road dust emissions.

To estimate air quality impacts from operations under the proposed Program, the air quality analysis in this PEIR focused on cargo types that would generate the highest amount of emissions at the Port. These include container and bulk cargos (break, liquid, and dry bulks). Inclusion of operational emissions from lesser-emitting cargo types or activities associated with the PMPU would not make the analysis substantially more conservative. The analysis evaluates the incremental full build-out that would occur within each planning area addressed by the PMPU. This incremental approach focuses on the changes in cargo handling activities that would occur from the proposed Program compared to existing conditions in 2011 (PMPU full build-out minus CEQA baseline).

For the air quality analysis it is assumed that full build-out of the proposed appealable/fill projects and land use changes would occur by 2025. This represents a conservative approach since it is based on year 2025 emission factors, which are comparatively higher than subsequent years. For example, the vehicle fleets associated with Port operations subsequent to 2025 would have newer units with lower emission standards and overall would generate lower emissions compared to the 2025 vehicle fleets. Full build-out of the proposed Program would not occur until several years after 2025, or potentially as far in the future as year 2035 planning horizon for the PMPU (Section 2.5.5, Program Schedule).

The following describes the methods used to estimate potential emissions from operational sources associated with the PMPU. Appendix D presents the methods uses to estimate operational emissions and impacts associated with the proposed Program.

Container Cargo Operations

Estimates of air emissions from proposed container cargo operations were based on two general methods, depending on the source of emissions: 1) for truck, train, and worker commuter vehicles, the analysis applied applicable emission factors to activity data developed for these sources by the project traffic evaluation and 2) for OGVs, assist tugboats, and CHE, the analysis used emission calculations conducted for the Berths 302-306 Project as surrogates to approximate levels of emissions from these sources. The Berths 302-306 Project analyses used the most current methods and activity data available to estimate emissions from future container operations at the Port. The Berths 302-306 Project analyses include an evaluation of year 2025 conditions, which coincides with the year evaluated for proposed air quality impacts in this PEIR. Future container activities under the PMPU would not operate exactly as those that were evaluated for the Berths 302-306 Project. However, they would be reasonably representative of container operations under the proposed Program.

The cargo throughputs used to estimate operational emissions from proposed container operations equate to the full build-out throughput levels of the proposed appealable/fill projects and land use changes within each planning area minus the CEQA baseline throughput levels for each area. The following describes the methods used to estimate air emissions from proposed container cargo activities.

Truck, Train, and Worker Commuter Vehicles

Truck and Worker Commuter Vehicles

Daily vehicle trip and vehicle miles travelled (VMT) data generated from the proposed Program traffic analyses for each planning area were used to estimate proposed truck and worker commuter vehicle emissions. The daily period evaluated by the analysis equates to a weekday during the peak month of Port activity. The following methods were used to estimate emissions from these sources:

- Off-terminal Operations - The traffic analyses provided daily VMT and vehicle speeds for roadways used by proposed trucks and autos within the SCAB. These data were processed into total VMT for speeds less than 10 mph and 5 mph increments starting at 10-15 mph and increasing to 65 mph;

- On-terminal Operations - Daily truck trips estimated by the traffic analyses were used to estimate on-terminal trucking operations, based on an average container terminal truck trip in 2011 at the Port: speed/length of 13 mph/1.7 miles and idling time of 0.54 hours (Starcrest Consulting Group, LLC. 2012); and,
- Emissions for trucks and autos were estimated using factors developed by the CARB EMFAC2011 on-road mobile source emissions model (CARB 2011). The model was run with inputs to simulate the average Port truck fleet in year 2025 that complies with the San Pedro Bay Ports CTP and CARB on-road vehicle standards (Starcrest Consulting Group, LLC. 2011). Emission factors for autos were based on the average SCAB fleet in 2025.

Trains

Emissions associated with hauling containers by rail would occur from 1) yard locomotives during switching activities at the rail yards and 2) line-haul locomotives during transport within the SCAB and idling at the rail yards. All of these emission sources would use diesel fuel. The following methods were used to estimate emissions from these sources:

- Line haul Operations - The traffic analyses provided daily train trips that each planning area would generate due to proposed container operations. These daily trips were converted into daily VMT, based on the type of cargo, rail yard, and rail lines accessed within the SCAB. Daily train VMT were then converted into daily locomotive Hp-Hrs with the following factors used by the Port 2011 Air Emissions Inventory to estimate locomotive emissions: 1) 6,344 tons per train; 2) 0.987 gallons of fuel per thousand ton-mile; and, 3) 20.8 Hp-Hrs per gallon;
- One line haul locomotive would idle for 3.5 hours per train round trip at either an on-dock or off-dock rail yard;
- Switching Operations - One switching locomotive would operate for 3.5 hours per line haul train round trip at either an on-dock or off-dock rail yard;
- Line haul locomotive emission factors for year 2025 were based on the USEPA nationwide locomotive emission standard implementation schedule (LAHD and USACE 2012). The emission factors for the nationwide locomotive fleet will decline in the future as older locomotives are replaced with newer locomotives that meet more stringent USEPA emission standards. Fuel sulfur content for all locomotive fuels in 2015 and beyond is 15 ppm; and,
- The emission factors for yard locomotives at the on-dock rail yards were based on current the PHL switch engine fleet that contains 16 Tier 3 compliant locomotives and six genset locomotives that emit at roughly Tier 2 levels. The emission factors for yard locomotives at the off-dock rail yards were based on the year 2025 USEPA nationwide locomotive emission standard implementation schedule.

Ocean Going Vessels, Assist Tugboats, and Cargo Handling Equipment

The following presents the methods used to estimate air emissions from OGVs, assist tugboats, and CHE during container cargo activities under the PMPU.

1. The container throughput for the full build-out of the PMPU includes contributions from the proposed appealable/fill projects and land use changes. The net increase in annual cargo throughput between these actions in each planning area and the CEQA baseline year of 2011 are 1) 2,238,000 TEUs for Planning Area 2 and 2) 5,281,000 TEUs for Planning Area 3. For Planning Area 3, the analysis evaluates the Berths 206-209 mixed use area as a container operation. Therefore, this approach evaluates the highest emissions-generating activity of any cargo type. The PMPU would not affect container cargo operations in Planning Area 4.
2. Project milestone year 2025 for the Berths 302-306 Project has an associated throughput level of 3,122,000 TEUs.
3. The ratios of PMPU incremental annual throughputs for each planning area compared to the Berths 302-306 Project year 2025 throughput are 1) 0.72 for Planning Area 2 and 2) 1.69 for Planning Area 3.
4. Peak daily air emissions estimated for OGVs, assist tugboats, and CHE by the Berths 302-306 Project in year 2025 were multiplied by the above ratios to estimate peak daily air emissions of these sources generated by the full build-out of container cargo operations within each planning area.

The following identifies specific assumptions and techniques used by the Berths 302-306 Project analysis and adopted by this PEIR to estimate air emissions from proposed OGVs, assist tugboats, and CHE. Table 3.2-9 includes a synopsis of the regulations that were assumed in the unmitigated operational emission calculations. Currently adopted regulations are treated as proposed Program elements rather than mitigation because they represent enforceable rules with or without program approval. Only current regulations and agreements were assumed as part of the unmitigated Program emissions for the various analysis years. CAAP measures in excess of currently adopted regulations that would take effect through project-specific approvals are treated as mitigations in this PEIR.

The scope of analysis for criteria pollutant emissions is limited to activities that would occur within the SCAB, which is consistent with the application of significance thresholds established by the SCAQMD for their jurisdiction. However, operational and geographical boundaries for the GHG analyses were expanded, as described below.

Container Ships

Emissions from the main engines, auxiliary engines, and boilers on container ships were calculated using emission factors and assumptions obtained from the *2009 Port of Los Angeles Inventory of Air Emissions* (Starcrest Consulting Group, LLC. 2010). To demonstrate compliance with the CARB OGV fuel sulfur regulation, ship main engines were assumed to use marine gas oil (MGO) or marine diesel oil (MDO) with an average sulfur content of 0.1 percent within 24 nm of the California coast. In addition, ship main engines were assumed to use MGO or MDO with an average sulfur content of 0.1 percent (1,000 ppm) within 200 nm of the California coast. A sulfur content of 0.1 percent represents the sulfur limit for an ECA under MARPOL ANNEX VI.

Table 3.2-9. Regulations and Agreements Assumed in the Unmitigated Operational Emissions

OGVs	*Tugboats*	*Terminal Equipment*	*Trucks*	*Trains*
Vessel Speed Reduction Program – 95 percent compliance (within 20 nm of the CA coast). **MARPOL Annex VI –**100 percent compliance. **CARB Ultra Low Sulfur Diesel –** marine gas oil or marine diesel oil at or below 0.1 percent sulfur (within 24 nm of the CA coast). **IMO ECA –** marine gas oil or marine diesel oil at or below 0.1 percent sulfur beginning in 2015 (within 200 nm of the CA coast). **Engine Standards for Marine Diesel Engines Tier 2-** 2011, Tier 3-2016.	**California Diesel Fuel Regulations** - 15 ppm sulfur starting in 2012. **Engine Standards for Marine Diesel Engines** - Tier 2 standards gradually phased in due to normal tugboat fleet turnover.	**CARB Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards** New yard trucks and new non-yard trucks Either a certified on-road engine meeting the current model year standards or a certified final Tier 4 off-road diesel engine. In-use yard trucks BACT through accelerated fleet turnover. In-use non-yard trucks BACT or retrofits (replacement to Tier 4 off-road engines or installation of a Level 3 VDECS). **California Diesel Fuel Regulations** - 15-ppm sulfur.	**Emission Standards for On-road Trucks** - Tiered standards gradually phased in over all years due to normal truck fleet turnover. **California Diesel Fuel Regulations** - 15-ppm sulfur. **Heavy-Duty Diesel Truck Idling Regulation** - On-terminal trucks are subject to idling limits. **Airborne Toxic Control Measure to Limit Diesel**-Fueled Commercial Motor Vehicle Idling - Diesel trucks are subject to idling limits. **CARB Drayage Regulation** – Starting in 2009, phase in state and federal emission standards. **Clean Truck Program** – By January 1, 2012, all trucks that do not meet 2007+ on-road Heavy Heavy-Duty Vehicle standards are banned.	**Emission Standards for Locomotives** - Tier 0, 1, and 2 standards gradually phased in over all years due to normal locomotive fleet turnover. **2005 CARB/Railroad Statewide Agreement** - Reduced line haul locomotive idling times assumed to take effect starting in 2006. **Switch Locomotive Modernization Agreement** - Tier 2 switch locomotives within on-dock rail yards. This supersedes the Emission Standards for Locomotives (above). **Nonroad Diesel Fuel Rule** - 15-ppm sulfur starting January 1, 2012. Applies to all haul locomotives. **California Diesel Fuel Regulations** -15-ppm sulfur. Applies to all switch locomotives.
Note: This table is not a comprehensive list of all applicable regulations; rather, the table lists key regulations and agreements that substantially affect the emission calculations for the proposed Program.				

The emission factors and fuels for container ships were assumed to remain unchanged in all future study years (2013 to 2035). Other assumptions regarding container ships include:

- During transit, emissions from ships were calculated from the berth to the edge of SCAQMD waters (roughly a 50-mile, one-way trip);
- The VSRP compliance rate for all future analysis years was assumed at 95 percent;
- During hoteling (without AMP), ships were assumed to turn off the main engines but leave the auxiliary engines and boilers running. With AMP, the auxiliary engines also would be turned off; but the boilers would remain running. As specified by CARB's California Port Regulations for At-Berth Ocean-Going Vessels, the following percentage of ships must use AMP at berth, 50 percent by 2014, 70 percent by 2017, and 80 percent by 2020; and,

- Hoteling durations were calculated based on future projected Port-average lifts per call, ship work rates, crane productivity, and mean cranes per ship. A 3-hour tie-up and untie time was included in the estimate (JWD Group 2002).

Tugboats

During proposed Program operations, tugboats would assist container ships while maneuvering and docking inside the Port breakwater. Tugboat emission factors were calculated using zero hour (new engine) emission factors from the CARB *Emissions Estimation Methodology for Commercial Harbor Craft Operating in California*, Appendix B (CARB 2007a). Emission factors were calculated using deterioration factors for harbor craft diesel engines from the 2009 Port Emissions Inventory. The analysis assumed that the assist tugboat fleet would replace main and auxiliary engines according to the CARB In-Use Harbor Craft Replacement Regulation.

All assist tugboats would use diesel fuel with a sulfur content limit of 15 ppm, in accordance with California Diesel Fuel Regulations. Two tugboats would assist the arrival of a container ship.

Terminal Cargo Handling Equipment

Terminal CHE includes yard tractors, rubber tired gantry (RTG) cranes, top handlers, sidepicks, forklifts, and other miscellaneous equipment. All equipment is assumed to be diesel powered with the exception of a certain number of propane powered forklifts. The marine terminal cranes used to lift containers on and off container ships would be electric and, therefore, would have no direct emissions.

Emissions of CO, VOC, NO_x, PM_{10}, and $PM_{2.5}$ from diesel-powered terminal equipment were calculated using emission factors derived from the CARB OFFROAD2007 Emissions Model (CARB 2006c). Although OFFROAD2007 does not have a direct module for CHE, it contains data on the individual equipment in other modules. Off-road equipment was assumed to be replaced with equipment complying with the CARB Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. This regulation requires that new off-road yard trucks are certified to the final Tier 4 off-road standards for the rated horsepower. Non-yard truck off-road equipment also must be certified to meet the Tier 4 or equivalent off-road emission standards based on the model year and rated horsepower of the equipment. Emission factors for SO_x were based on the fuel consumption rate of the equipment and a diesel sulfur content of 15 ppm.

Automated Backlands

Future operations eventually may include automated systems for handling cargo at new container cargo terminals. Developing and implementing automated operations would depend on a number of factors that affect economic and technological feasibility. The automated system would include fully electric shore-side gantry cranes, automated stacking cranes, and landside transfer cranes as well as diesel-electric automated guided vehicles. This electric and diesel-electric equipment would replace the diesel yard tractors, side picks, top picks, and rubber-tired gantry cranes used in conventional container terminals. As demonstrated though the CAAP Technology Advancement Program (TAP), use of automated cargo handling systems would result in lower emissions of criteria pollutants, DPM, and GHGs compared to

operations at conventional container terminals. However, since it is unknown when Port terminals will begin to implement these technologies, this PEIR does not include an analysis of these lower-emitting systems.

Bulk Cargo Operations

To evaluate future break, liquid, and dry bulk cargo activities under the proposed Program, this PEIR relies on analyses conducted for the Port 2011 Air Emissions Inventory to define potential levels of daily unmitigated/mitigated emissions from these activities. The net changes in bulk cargo land use acreages predicted under the PMPU for each planning area (PMPU minus the existing year 2011 conditions) were matched to bulk cargo land use acreages and associated emissions in the Port 2011 Emissions Inventory using the following methods:

1. Net changes in areas for break bulk, liquid bulk, and dry bulk land uses for the entire PMPU are -11.6, -17.2, and -3.5 acres, respectively. The Port's 2011 Emissions Inventory treated the existing Berths 202-212 site (26.6 acres) in Planning Area 3 as a break bulk facility and the air quality analysis uses the same definition for the existing conditions of this site. As a result, the proposed changes in acres evaluated in the air quality analysis differ by -26.6/+26.6 for break bulk/dry bulk land uses compared to the acres presented in Section 2.5.4, Changes in Land Use Acreage, of this PEIR. Total areas of break bulk, liquid bulk, and dry bulk terminals at the Port in 2011 were 123.7, 117.4, and 7 acres, respectively (Starcrest Consulting Group, LLC. 2012);
2. The ratios of net changes in break bulk acres by planning area to the Port 2011 break bulk acres are -2.0/123.7 (-0.02), -26.6/123.7 (-0.22), and 17.0/123.7 (0.14) for Planning Areas 2, 3, and 4, respectively;
3. Air emissions estimated for break bulk cargo activities in year 2011 at the Port were multiplied by the above ratios to estimate air emissions for break bulk activities affected by the proposed Program within Planning Areas 2 through 4;
4. The net changes in liquid bulk acres are 0.4, -16.6, and -1.0, respectively, for Planning Areas 2 through 4. For Planning Area 2, the analysis evaluates the 8 acres of liquid and break bulk mixed use as a liquid bulk operation. Therefore. this approach evaluates the higher emissions-generating activity of these two cargo types;
5. Ratios of the net changes in liquid bulk acres to existing 2011 acres are 0.003, -0.14, and -0.01, respectively, for Planning Areas 2 through 4;
6. Air emissions estimated for liquid bulk cargo activities in year 2011 at the Port were multiplied by the above ratios to estimate air emissions for liquid bulk activities affected by the PMPU within each planning area;
7. The ratio of the net change in dry bulk acres to existing 2011 acres is -3.5/7.0, or -0.50. All of these changes would occur in Planning Area 2;
8. Air emissions estimated for dry bulk cargo activities in year 2011 at the Port were multiplied by -0.50 to estimate air emissions for dry bulk activities affected by the PMPU; and,
9. Annual bulk cargo incremental emissions estimated above were divided by 365 days to generate annual average daily emissions. Due to a lack of

information on acute Port operations in 2011, the analysis did not develop peak daily emissions for bulk cargo activities.

Peak daily emissions estimated for proposed container operations were added to average daily emissions from bulk cargo operations to generate total peak daily operational emissions that potentially would occur from the PMPU.

Ambient Pollutant Impacts from Operational Activities

Given the programmatic nature of this PEIR, air dispersion modeling to estimate ambient pollutant concentrations from proposed operations is not possible as it requires project-level specific information regarding source geometries and locations. As such, this PEIR uses the results of the air dispersion modeling analysis conducted for the operation of the Berths 302-306 Project to approximate ambient pollutant impacts that could occur from operations under the proposed Program. The Berths 302-306 Project analysis evaluated the highest peak daily emissions for each pollutant of concern that would occur from operations for years 2012 through 2027. This approach defines relative and not necessarily exact levels of ambient pollutant impacts that would occur from operations under the proposed Program. However, it generates meaningful results, since 1) sources associated with the PMPU would operate in similar source configurations (marine terminals, for example) as the Berths 302-306 Project and 2) many PMPU sources would operate in the same locations as those associated with the Berths 302-306 Project, including OGVs in transit, locomotives line hauling trains within and outside of the Port, and trucks transporting containers on roadways within and adjacent to the Port. Therefore, this approach provides an adequate evaluation of proposed ambient air quality impacts for use in this PEIR.

Assessment of Health Risks

Given the programmatic nature of this PEIR, air dispersion modeling to estimate health risks from proposed construction and operations is not possible as it requires project-level specific information regarding source geometries and locations relative to receptor locations. As such, this PEIR uses the results of HRAs conducted in previous LAHD CEQA/NEPA documents for proposed container terminal projects to qualitatively estimate public health effects that would occur from activities under the proposed Program. These HRAs evaluated emissions of TACs, including DPM and subsets of TACs found in VOCs and PM, to quantify individual lifetime cancer risks, cancer burden, and chronic and acute non-cancer health effects. The main sources of TACs evaluated in these HRAs would be nearly identical to those associated with the proposed Program, including construction equipment, ships, tugboats, terminal equipment, locomotives, trucks, and worker commuter vehicles.

This PEIR does not evaluate cancer burden effects, as this analysis is dependent on defining the exact locations of sources of TAC emissions and nearby residential receptors. Project-specific information on source locations are not known at this time and therefore it would be problematic to produce a meaningful analysis of proposed cancer burden impacts. Estimates of individual cancer risks and chronic and acute non-cancer effects are adequate to define health impacts that could occur from the proposed Program.

The exposure duration assumed in the HRAs for cancer risks was 70 years for a residential receptor and 40 years for an occupational receptor. The period of analyses for acute and chronic non-cancer effects were 1-hour and annual exposure periods, respectively. The HRAs were conducted in accordance with OEHHA and SCAQMD guidelines.

To qualitatively estimate public health effects from construction and operations under the PMPU, this PEIR compares maximum annual cargo throughput levels estimated for each planning area to those evaluated in previous LAHD CEQA/NEPA HRAs to approximate public health effects relative to the results in these HRAs. While estimations of cancer risks generally are based on 70 years of activity and exposure, maximum annual cargo throughputs are adequate indicators of 70-year activity levels and resulting TAC emissions for use in this qualitative analysis. The HRAs used for these comparisons are found in the following LAHD CEQA/NEPA documents: 1) Berths 97-109 (China Shipping) Container Terminal Project EIS/EIR; 2) Berths 136-147 (TraPac) Container Terminal Project EIS/EIR; and, 3) Berths 302-306 Project EIS/EIR.

The qualitative approach used in this PEIR defines relative and not necessarily exact levels of health effects that would occur from the proposed Program. This is appropriate since the quantitative HRAs that this approach refers to evaluate exact locations of residential, occupational, and sensitive receptors relative to locations of proposed sources. The source/receptor distances associated with the proposed Program would differ somewhat from those evaluted by these HRAs. Therefore, the health impacts estimated for the proposed Program could be somewhat higher or lower than those identified in these analyses. Nevertheless, this approach provides an adequate level of accuracy for defining impacts of TACs from the proposed Program since many of the sources associated with the PMPU would operate in source configurations and locations that are similar to those evaluated in the previous LAHD CEQA/NEPA documents, as described in the previous section.

PM Morbidity & Mortality Considerations

Particles small enough to be inhaled into the deepest parts of the lung are a public health concern. Respirable particles (PM_{10} and $PM_{2.5}$) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis, and other lung diseases. Children, the elderly, exercising adults, and people suffering from asthma are especially vulnerable to adverse health effects of PM_{10} and $PM_{2.5}$. Air quality analyses associated with recent CEQA documents for proposed terminal development projects in the Port discuss potential health effects caused by DPM emissions and the regulatory impetus to address their health impacts (LAHD and USACE 2012). Since activities from the proposed Program would generate emissions of PM (mainly in the form of DPM and $PM_{2.5}$), this PEIR also discusses the potential for these emissions to increase mortality and morbidity in the region.

In addition, since mortality and morbidity studies represent major inputs used by the CARB and USEPA to set the CAAQS and NAAQS, project-level mortality and morbidity impacts are indirectly evaluated as part of the project $PM_{10}/PM_{2.5}$ ambient impact analyses presented under Impact AQ-4 in Section 3.2.4.3, Impacts and Mitigation.

The Port uses the SCAQMD ambient significance threshold for $PM_{2.5}$ of 2.5 $\mu g/m^3$ as a trigger level to quantify PM mortality and morbidity effects for CEQA purposes. Since the adoption of this methodology by the Port, CARB has updated their approach to estimating premature death associated with exposure to fine particulate matter (CARB 2010). In their updated methodology, CARB relies on recent methods developed by the USEPA, as presented in *Quantitative Health Risk Assessment for Particulate Matter* (USEPA 2010c). Three key elements of this updated approach include: 1) limiting the evaluation to cardiovascular disease-related mortality; 2) adoption of an annual average $PM_{2.5}$ concentration threshold of 5.8 $\mu g/m^3$ for quantifying mortality; and, 3) revision of the coefficient used to relate mortality to changes in $PM_{2.5}$ concentrations. However, the air quality assessment in this PEIR uses a qualitative approach to evaluate potential mortality and morbidity effects from the PMPU, given the programmatic nature of the analysis.

3.2.4.1.3 Greenhouse Gases

GHG emissions generated from proposed operations were calculated with the methods provided in the CCAR General Reporting Protocol, Version 3.1 (CCAR 2009). The General Reporting Protocol is the guidance document that the Port and other CCAR members have used to prepare annual Port-wide GHG inventories for the CCAR. Therefore, for consistency, the General Reporting Protocol also was used in this study. However, to adapt the Protocol for CEQA purposes, a modification to the Protocol operational and geographical boundaries was necessary.

The estimation of GHG emissions from potential construction and operations are based on the same sources evaluated for criteria pollutants in this PEIR. In addition, potential operational sources of GHGs include fugitive HFC emissions from refrigerated containers.

GHG Operational and Geographical Boundaries

For the purposes of CEQA, TCR has not developed a protocol for determining the operational or geographical boundaries for some Port-related emissions sources, such as ships. For those sources that travel out of California (trucks, trains, and ships), GHG emissions were based on the following routes:

- For trucks and autos, travel within the SCAB;
- For trains, the average travel distance between Port on-dock rail yards and the eastern border of California is 342 miles; and,
- For cargo ships, ocean transit is along a 170-nm shipping route between the Port and the California 3-mile jurisdictional boundary west of Point Conception. The analysis conservatively assumed that all ships associated with the proposed Program 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" (defined as 0 to 3 miles offshore).

This approach assumes that proposed GHG emissions that would occur within the State of California are adequate as indicators to evaluate GHG impacts for CEQA purposes. This approach is consistent with the TCR goal of reporting all GHGs

within the State of California. Although activities from proposed sources of GHGs would extend beyond the California border, they are not readily quantifiable and any evaluation would produce speculative results on a project-specific or programmatic level. Proposed GHG sources that would occur outside of California are discussed in Chapter 4.0, Cumulative Analysis.

3.2.4.1.4 CEQA Baseline

The analysis of air quality impacts is based on a comparison of the proposed Program to the baseline existing conditions. Section 15125 of the CEQA Guidelines requires EIRs to include a description of the physical environmental conditions in the vicinity of a project that exist at the time of the NOP. These environmental conditions normally constitute the baseline physical conditions by which the CEQA lead agency determines if an impact is significant.

This air quality analysis uses a CEQA baseline equating to activities that occurred at the Port in calendar year 2011 (CEQA baseline) to analyze air quality impacts from the proposed Program. The Port air emissions inventory for calendar year 2011 describes the emission levels for this CEQA baseline condition (Tables 3.2-4 through 3.2-6). To evalaute emission increases due to the proposed Program (proposed Program minus CEQA baseline), emissions for the CEQA baseline are fixed at 2011 levels for all future years. This approach was taken, as it is beyond the scope of this PEIR to develop a future CEQA baseline that estimates how currently approved regulations would affect all mobile source emissions from Port operations in future years. Such a scenario would include a turn over of existing vehicle fleets to units with lower-emitting standards and would have lower emissions compared to the CEQA baseline. In concept, comparison of emissions from the proposed Program to such a future CEQA baseline would result in higher incremental emissions and resulting impacts compared to the CEQA baseline.

The CEQA baseline represents the setting at a fixed point in time and differs from the No-Program Alternative (Alternative 1) in that the No-Program Alternative addresses what is likely to happen at a project location over time, starting from the existing conditions. Therefore, the No-Program Alternative allows for growth that could be expected to occur without additional approvals, whereas the CEQA baseline does not.

3.2.4.2 Thresholds of Significance

The following thresholds were used in this study to determine the significance of proposed air quality impacts for CEQA purposes. They are based primarily on the standards established by the City of Los Angeles in the *L.A. CEQA Threshold Guide* (City of Los Angeles 2006). The *L.A. CEQA Threshold Guide* essentially incorporates by reference the CEQA Air Quality Handbook and associated significance thresholds developed by the SCAQMD.

The following thresholds are used commonly to determine the significance of air quality impacts from individual projects and proposed developments. Use of these thresholds to evalute several actions combined within each planning area is therefore a conservative approach.

3.2.4.2.1 Construction Thresholds

The *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) references the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993) and USEPA AP-42 for calculating and determining the significance of construction emissions (USEPA 2006b). The SCAQMD thresholds are updated as necessary to address new regulations and standards (SCAQMD 2011). The USEPA periodically updates emission calculation methods in its AP-42 document (USEPA 2012b). Each lead city department has the responsibility to determine the appropriate standards.

For the purposes of this study, the air quality thresholds of significance for construction activities are based on emissions and concentration thresholds established by the SCAQMD (2011). Construction-related air emissions would be considered significant if:

AQ-1: The proposed Program would result in construction-related peak daily emissions that exceed any of the SCAQMD thresholds of significance in Table 3.2-10. For determining CEQA significance, these thresholds are compared to peak daily construction emissions.

Table 3.2-10. SCAQMD Daily Emission Thresholds

Air Pollutant	*Emission Threshold (Pounds/Day)*	
	Construction	*Operational*
VOC	75	55
CO	550	550
NO_x	100	55
SO_x	150	150
PM_{10}	150	150
$PM_{2.5}$	55	55
Sources: City of Los Angeles 2006; SCAQMD 2011		

AQ-2: Proposed Program construction would result in offsite ambient air pollutant concentrations that exceed the SCAQMD thresholds of significance in Table 3.2-11.

To evaluate construction impacts to ambient 1-hour NO2 levels, the analysis used the current SCAQMD 1-hour NO2 threshold (0.18 ppm), per SCAQMD guidance. Ambient SO_2 impacts from construction were not evaluated since daily emissions would be well below the SCAQMD daily emission threshold; therefore, ambient concentrations would be negligible. Although Los Angeles County is a nonattainment area for lead, it is not a pollutant of concern for the proposed Program; therefore, no modeling was performed for this pollutant.

Table 3.2-11. SCAQMD Thresholds for Ambient Air Quality Concentrations

Air Pollutant	*Ambient Concentration Threshold*	
	Construction	*Operational*
NO_2		
1-hour average (state)	0.18 ppm (339 µg/m^3)	0.18 ppm (339 µg/m^3)
1-hour average (federal)		0.100 ppm (188 µg/m^3)
Annual average (state)	0.030 (57 µg/m^3)	0.030 (57 µg/m^3)
Annual average (federal)	0.0534 (100 µg/m^3)	0.0534 (100 µg/m^3)
PM_{10} or $PM_{2.5}$		
24-hour average	10.4 µg/m^3	2.5 µg/m^3
Annual average (PM_{10} only)	1.0 µg/m^3	1.0 µg/m^3
CO		
1-hour average	20 ppm (23,000 µg/m^3)	20 ppm (23,000 µg/m^3)
8-hour average	9.0 ppm (10,000 µg/m^3)	9.0 ppm (10,000 µg/m^3)
SO_2		
1-hour average (state)	0.25 ppm	0.25 ppm
1-hour average (national)	0.075 ppm	0.075 ppm
24-hour average (national)	0.04 ppm	0.04 ppm

Notes:
The SCAQMD has also established concentration thresholds for SO_2 sulfates, and lead; but construction emissions of these pollutants would be negligible, thus concentration standards would not be exceeded.
To evaluate construction impacts to ambient 1-hour NO2 levels, the analysis used the current SCAQMD 1-hour NO2 threshold (0.18 ppm). To evaluate operational impacts, the analysis used the 1-hour NAAQS (0.10 ppm), per SCAQMD guidance. To attain the federal standard, the 3-year average of the 98th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.100 ppm.
Federal 1-hour average NO_2 concentration is based on the NAAQS because it is more stringent than the SCAQMD thresholds.
The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds; the maximum predicted impact from construction activities (without adding the background concentration) is compared to these thresholds.
The CO thresholds are absolute thresholds; the maximum predicted impact from construction activities is added to the background concentration for the proposed Program vicinity and compared to the threshold.
Source: SCAQMD 2011

3.2.4.2.2 Operations Thresholds

The *L.A. CEQA Thresholds Guide* provides specific significance thresholds for operational air quality impacts that also are based on SCAQMD standards. For the purposes of this study, a project would create a significant impact if it would result in one or more of the following.

AQ-3: The proposed Program operational emissions would exceed 10 tons per year of VOCs or any of the SCAQMD peak day emission thresholds of significance in Table 3.2-10.

For determining CEQA significance, these thresholds are compared to the net change in proposed Program emissions relative to CEQA baseline conditions.

AQ-4: The proposed Program operations would result in offsite ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance in Table 3.2-11.

To evaluate operational impacts to ambient NO_2 levels, the analysis replaced the use of the current SCAQMD NO_2 thresholds with the more stringent revised 1-hour federal and annual California ambient air quality standards of 188 and 57 $\mu g/m^3$, respectively.

AQ-5: The proposed Program-generated on-road traffic would result in either of the following conditions at an intersection or roadway within 0.25 mile of a sensitive receptor:

- Causes or contributes to an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9.0 ppm, respectively; or,
- The incremental increase is equal to or greater than 1.0 ppm for the California 1-hour CO standard or 0.45 ppm for the 8-hour CO standard.

AQ-6: The proposed Program would create an objectionable odor at the nearest sensitive receptor.

AQ-7: The proposed Program would expose receptors to significant levels of TACs. The determination of significance was made as follows:

- Maximum Incremental Cancer Risk for Residential Receptors >10 in 1 million;
- Cancer Burden > 0.5 excess cancer cases in areas where the maximum incremental cancer risk for residential receptors >1 in 1 million; and,
- Non-cancer Hazard Index >1.0 (project increment).

AQ-8: The proposed Program would conflict with or obstruct implementation of an applicable AQMP or the CAAP.

GHG-1: The proposed Program would produce GHG emissions that would exceed a CEQA threshold.

CEQA directs lead agencies to adopt thresholds for use in determining the significance of environmental effects. In October 2008 the CARB developed initial guidance for air districts to consider in determining the significance of GHGs under CEQA. At that time, CARB proposed a threshold of 7,000 metric tons per year of CO_{2e} for industrial projects. They did not provide a numerical threshold for commercial and residential projects, stating it would be developed in the future.

In the SCAB, the SCAQMD Board has only adopted CEQA thresholds for GHGs relevant to industrial projects (stationary source) for which it is the lead agency (SCAQMD 2011). This threshold is generally set at 10,000 metric tons per year of CO_{2e} for a proposed project. Construction emissions are amortized over 30 years and included with operational emissions for comparison to the 10,000-metric tons per year CO_{2e} threshold.

The current *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) does not include comprehensive thresholds for GHGs. Therefore, for purposes of this PEIR, the Port is utilizing the following as its CEQA threshold of significance:

- The proposed Program may have a significant impact on the environment if proposed emissions exceed 10,000 metric tons per year of CO_{2e}.

GHG-2: The proposed Program would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

3.2.4.3 Impacts and Mitigation

Impact AQ-1: Construction activities associated with the proposed Program would produce emissions that exceed a SCAQMD Daily Emission Threshold.

The impact criterion relates only to construction, so operational impacts are not discussed in the analyses for this criterion.

Planning Area 2

Construction

The proposed Program within Planning Area 2 includes two landfills (China Shipping and Yang Ming Terminal Redevelopment), relocation of a liquid bulk terminal (Berths 187-189 Liquid Bulk Relocation), and land use changes involving terminal/backland development. Table 3.2-12 presents estimates of daily unmitigated emissions that could occur from terminal/backland development and landfill activities within Planning Area 2. The largest sources of emissions due to terminal development include 1) haul trucks (including pile deliveries) and concrete trucks during wharf construction; 2) cold plane equipment during reefer area expansion; 3) a general cargo ship and tugboat during crane installation; and, 4) cold plane equipment during grading, paving and striping activities. The main sources of emissions associated with landfill construction activities include 1) tugboats that deliver dike rock and transport dredge sediments; 2) barge equipment used to place rip-rap; and, 3) equipment used to handle surcharge.

Table 3.2-12 identifies construction emissions that would occur from a peak day of activity in Planning Area 2 due to combined terminal/backlands development and landfill construction activities. This peak day scenario would include 1) all activities identified for terminal/backlands development and 2) trench excavation and dike construction quarry run placement due to general landfill construction. This is the case, as landfill construction progresses sequentially and typically no more than two activities can occur at the same time.

Table 3.2-12. Unmitigated Peak Daily Emissions from Construction Activities Associated with the PMPU

Construction Type/Activity	Peak Daily Emissions (Pounds)					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Terminal Development						
Wharf Construction	73	268	692	1	113	45
Backland Construction	37	153	331	0	53	22
Crane Installation	101	95	794	37	97	90
Building Construction	13	54	127	0	23	9
Reefer Area Expansion	13	52	119	0	11	6
Utility Infrastructure	5	18	49	0	2	2
Worker Commutes	1	11	1	0	16	4
Peak Daily Emissions – Terminal Development [a]	**243**	**651**	**2,113**	**38**	**313**	**176**
SCAQMD Thresholds	**75**	**550**	**100**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
General Landfill Construction						
Demolition	25	93	266	0	11	10
Trench Excavation	32	122	371	0	11	11
Dike Construction Quarry Run Placement	18	133	568	0	16	15
Dike Construction Armor Stone Placement	18	133	568	0	16	15
Coarse Grain Dredging and Transport – Clamshell	33	125	388	1	12	11
Peak Daily Emissions – General Landfill Construction [b]	**50**	**255**	**939**	**0**	**26**	**25**
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Confined Landfill Construction						
Demolition	25	92	264	0	11	10
Trench Excavation	32	122	371	0	11	11
Dike Construction Quarry Run Placement	17	124	529	0	15	14
Dike Construction Armor Stone Placement	17	119	509	0	14	13
Contaminated Sediment Dredging and Transport	16	63	193	0	6	6
Coarse Grain Dredging and Transport - Clamshell	33	125	388	1	12	11
Peak Daily Emissions – Confined Landfill Construction [b]	**49**	**246**	**890**	**0**	**26**	**25**
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Combined Peak Day Emissions Scenario – Terminal Development and Landfill Construction [c]	**293**	**906**	**3,052**	**38**	**339**	**201**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes:

a. Peak daily emissions from terminal development would occur from all seven activities identified for this action.
b. Peak daily emissions from either landfill construction type would occur from (a) trench excavation and (b) quarry run placement during dike construction.
c. Represents peak daily emissions from terminal development and general landfill construction activities.

Planning Area 3

Construction

The proposed Program within Planning Area 3 includes one landfill project (Berth 300 Development) and several land use changes involving terminal/backland developments.

Table 3.2-12 presents estimates of daily unmitigated emissions that could occur from terminal/backlands development and landfill activities within Planning Area 3. Peak

daily emissions from construction within Planning Area 3 could occur from combined terminal development and general landfill construction activities.

Planning Area 4

Construction

The proposed Program within Planning Area 4 includes three appealable/fill projects (Al Larson Marina, Tri Marine Expansion, and 339 Cannery Street Adaptive Reuse), as well as terminal and backland development activities.

The lesser amount of construction activities proposed within Planning Area 4 would produce lower peak daily emissions compared to those identified for terminal development activities in Table 3.2-12.

Impact Determination

Construction

The data in Table 3.2-12 show that unmitigated peak daily emissions from either terminal development or landfill construction would exceed the SCAQMD daily emission thresholds for VOCs and NO_x. In addition peak daily emissions from terminal development would exceed the CO, PM_{10}, and $PM_{2.5}$ thresholds. Further, the peak day scenario of combined terminal/backlands development and landfill construction activities would exceed all SCAQMD daily emission thresholds except SO_x. Therefore, unmitigated construction emissions within Planning Areas 2 and 3 would be significant for VOCs, CO, NO_x, PM_{10}, and $PM_{2.5}$. Peak daily emissions from terminal development would occur from all seven activities identified for this action. Peak daily emissions from landfill construction would occur from trench excavation and quarry run placement during dike construction at project locations. Construction activities within Planning Area 4 would have the potential to produce significant levels of NO_x and PM_{10} emissions.

Mitigation Measures

The following mitigation measures would reduce air emissions from construction activities and would be implemented, as applicable, for the proposed appealable/fill projects and land use changes under the proposed Program.

MM AQ-1: Harbor Craft Used During Construction

1. All harbor craft with C1 or C2 marine engines must utilize a USEPA Tier-3 engine, or cleaner. This measure shall be met, unless the contractor is able to provide proof that one of the following circumstances exists:
    a. A piece of specialized equipment is unavailable in a controlled form, or within the required Tier level, within the state of California, including through a leasing agreement;
    b. A contractor has applied for necessary incentive funds to put controls on a piece of uncontrolled equipment planned for use on the project, but the application process is not yet approved, or the application has been approved, but funds are not yet available; and,

c. A contractor has ordered a control device for a piece of equipment planned for use on the project, or the contractor has ordered a new piece of controlled equipment to replace the uncontrolled equipment, but that order has not been completed by the manufacturer or dealer. In addition, for this exemption to apply, the contractor must attempt to lease controlled equipment to avoid using uncontrolled equipment, but no dealer within 200 miles of the project has the controlled equipment available for lease.

MM AQ-2: Cargo Ships Used During Construction

1. All ships & barges used primarily to deliver construction-related materials to a LAHD-contractor construction site shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.
2. These ships also must use low-sulfur fuel (maximum sulfur content of 0.2 percent) in auxiliary engines, main engines, and boilers within 40 nm of Point Fermin. On January 1, 2014, this requirement is superseded by the CARB regulation for OGVs operating within 24 nm of the shoreline where the maximum allowable sulfur content is 0.1 percent. This mitigation measure goes above and beyond the CARB rule, as it requires 0.2 percent sulfur fuel within 40 nm from shore, whereas the CARB rule only applies to vessels within 24 nm of the shoreline, prior to January 1, 2014. In 2015, the North American ECA sulfur fuel limitation will be 0.1 percent.

MM AQ-3: Fleet Modernization for On-Road Trucks Used During Construction

1. Trucks hauling material such as debris or any fill material shall be fully covered while operating off LAHD property.
2. Idling shall be restricted to a maximum of 5 minutes when vehicles are not in use.
3. USEPA Standards:
   a. For on-road trucks with a gross vehicle weight rating (GVWR) of at least 19,500 pounds (except for Import Haulers and Earth Movers): comply with USEPA 2007 on-road emission standards for PM_{10} and NO_x (0.01 g/bhp-hr and 1.2 g/bhp-hr or better, respectively);
   b. For Import Haulers with a GVWR of at least 19,500 pounds used to move dirt and debris to and from the construction site via public roadways: comply with USEPA 2004 on-road emission standards for PM_{10} and NO_x (0.10 g/bhp-hr and 2.0 g/bhp-hr, respectively); and,
   c. For Earth Movers with a GVWR of at least 19,500 pounds used to move dirt and debris within the construction site: Comply with USEPA 2004 on-road emission standards for PM_{10} and NO_x (0.10 g/bhp-hr and 2.0 g/bhp-hr, respectively).

MM AQ-4: Fleet Modernization for Construction Equipment (except Vessels, Harbor Craft and On-Road Trucks)

All dredging equipment shall be electric, unless contractor can demonstrate that such equipment is not feasible for a specific activity.

1. Construction equipment shall incorporate, where feasible, emissions-savings technology such as hybrid drives and specific fuel economy standards.
2. Idling shall be restricted to a maximum of 5 minutes when not in use.
3. Equipment Engine Specifications:
    a. Prior to January 1, 2015: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emission standards at a minimum. In addition, this equipment shall be retrofitted with a CARB-verified Level 3 Diesel Emissions Control System (DECS); and,
    b. From January 1, 2015 on: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 4 off-road emission standards at a minimum.

MM AQ-5: Construction Best Management Practices

Construction activities due to the proposed Program shall comply with LAHD Sustainable Construction Guidelines. These general construction BMPs include:

1. Use of diesel oxidation catalysts and catalyzed diesel particulate traps;
2. Maintain equipment according to manufacturers' specifications;
3. Restrict idling of construction equipment and on-road heavy-duty trucks to a maximum of 5 minutes when not in use;
4. Install high-pressure fuel injectors on construction equipment vehicles;
5. Maintain a minimum buffer zone of 300 meters between truck traffic and sensitive receptors;
6. Enforce truck parking restrictions;
7. Provide onsite services to minimize truck traffic in or near residential areas, including, but not limited to, the following services: meal or cafeteria services, automated teller machines, etc;
8. Re-route construction trucks away from congested streets or sensitive receptor areas;
9. Provide dedicated turn lanes for movement of construction trucks and equipment on- and offsite; and,
10. Use electric power in favor of diesel power where available.

MM AQ-6: Additional Fugitive Dust Controls

The calculation of fugitive dust (e.g., PM) from Project earth-moving activities assumes a 60 percent reduction from uncontrolled levels to simulate rigorous watering of sites and use of other measures (listed below) to ensure compliance with SCAQMD Rule 403. SCAQMD Rule 403 requires a Fugitive Dust Control Plan be prepared and approved for construction sites. The project construction contractor shall obtain a Rule 403 Permit from SCAQMD prior to construction.

The following measures shall be included in the contractor's Fugitive Dust Control Plan to enable fugitive dust emission reductions of at least 90 percent compared to uncontrolled levels:

1. All projects shall follow the SCAQMD BACT measures, as outlined in Table 1 in Rule 403. Large construction projects (on a property which contains 50 or more disturbed acres) shall also follow Rule 403 Tables 2 and 3;
2. Active grading sites shall be watered three times per day;
3. Contractors shall apply approved non-toxic chemical soil stabilizers to all inactive construction areas or replace groundcover in disturbed areas;
4. Contractors shall provide temporary wind fencing around sites being graded or cleared;
5. Trucks hauling dirt, sand, or gravel shall be covered or shall maintain at least 2 feet of freeboard in accordance with Section 23114 of the California Vehicle Code (*Spilling Loads on Highways*);
6. Construction contractors shall 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;
7. The grading contractor shall suspend all soil disturbance activities when winds exceed 25 mph or when visible dust plumes emanate from a site. If construction is delayed, disturbed areas shall be stabilized;
8. Open storage piles (greater than 3 feet tall and a total surface area of 150 square feet) shall be covered with a plastic tarp or chemical dust suppressant;
9. Materials shall be stabilized while loading, unloading and transporting to reduce fugitive dust emissions;
10. Belly-dump truck seals shall be checked regularly to remove trapped rocks to prevent possible spillage; and,
11. Projects shall comply with track-out regulations and provide water while loading and unloading to reduce visible dust plumes.

MM AQ-7: General Mitigation Measure

For any of the above mitigation measures (**MM AQ-1 through MM AQ-6**), if a CARB-certified technology becomes available and is shown to be as effective as or better in terms of emissions performance than the existing measure, the technology shall replace the existing measure pending approval by the LAHD. Measures shall be set at the time a specific construction contract is advertised for bids.

MM AQ-8: Special Precautions near Sensitive Sites

All construction activities located within 1,000 feet of sensitive receptors (defined as schools, playgrounds, daycares, and hospitals) shall notify each of these sites in writing at least 30 days before construction activities begin.

Table 3.2-13 presents mitigated peak daily emissions that could occur from terminal development and landfill activities under the PMPU due to implementation of **MM AQ-1 through MM AQ-8**. These data show that mitigated peak daily emissions from either terminal development or landfill construction would exceed the SCAQMD daily emission threshold for NO_x. In addition, peak daily emissions from terminal development would exceed the VOC, CO, PM_{10}, and $PM_{2.5}$ thresholds.

Further, mitigated emissions from the peak day scenario of combined terminal/backlands development and landfill construction activities would exceed all SCAQMD daily emission thresholds except SOx. Therefore, mitigated construction emissions would be significant for VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$.

Table 3.2-13. Mitigated Peak Daily Emissions from Construction Activities Associated with the proposed Program

Construction Type/Activity	*Peak Daily Emissions (Pounds)*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Terminal Development						
Wharf Construction	69	260	334	1	87	21
Backland Construction	37	152	218	0	40	9
Crane Installation	72	95	598	18	78	72
Building Construction	13	54	109	0	19	5
Reefer Area Expansion	13	52	90	0	7	2
Utility Infrastructure	5	18	41	0	0	0
Worker Commutes	1	11	1	0	16	4
Peak Daily Emissions – Terminal Development[a]	**211**	**641**	**1,392**	**20**	**246**	**114**
SCAQMD Thresholds	**75**	**550**	**100**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
General Landfill Construction						
Demolition	11	55	202	0	2	2
Trench Excavation	1	4	15	0	0	0
Dike Construction Quarry Run Placement	15	125	360	0	10	10
Dike Construction Armor Stone Placement	15	125	360	0	10	10
Coarse Grain Dredging and Transport – Clamshell	1	8	28	0	1	1
Peak Daily Emissions – General Landfill Construction[b]	**16**	**165**	**375**	**0**	**10**	**10**
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Confined Landfill Construction						
Demolition	11	55	201	0	2	2
Trench Excavation	1	4	15	0	0	0
Dike Construction Quarry Run Placement	14	116	335	0	9	9
Dike Construction Armor Stone Placement	14	116	335	0	9	9
Contaminated Sediment Dredging and Transport	1	4	13	0	0	0
Coarse Grain Dredging and Transport – Clamshell	1	8	28	0	1	1
Peak Daily Emissions – Confined Landfill Construction[b]	**15**	**120**	**350**	**0**	**9**	**9**
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Combined Peak Day Emissions Scenario – Terminal Development and Landfill Construction[c]	**227**	**806**	**1,767**	**20**	**256**	**124**
SCAQMD Thresholds	**75**	**550**	**100**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes:
a. Peak daily emissions from terminal development would occur from all 7 activities identified for this action.
b. Peak daily emissions from either landfill construction type would occur from (a) trench excavation and (b) quarry run placement during dike construction.
c. Represents peak daily emissions from terminal development and general landfill construction activities.

Residual Impacts

Although reductions would be achieved with mitigation, impacts would be significant and unavoidable during construction for VOC, CO, NO_x, PM_{10}, and $PM_{2.5}$.

Impact AQ-2: Construction activities associated with the PMPU would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

The impact criterion relates only to construction, so operational impacts are not discussed in the analyses for this criterion.

Planning Area 2

Construction

Table 3.2-14 summarizes the results of a dispersion modeling analysis that estimates the maximum ambient impact of unmitigated emissions that would occur from construction of the proposed Berths 302-306 Project. These data are used to approximate unmitigated ambient criteria pollutant impacts that could occur from terminal/backlands development and landfill projects in Planning Area 2. The data in Table 3.2-14 represent maximum ground level concentrations of NO_2, CO, PM_{10}, and $PM_{2.5}$ that would occur from proposed construction without mitigation.

Table 3.2-14. Estimated Maximum Ambient Pollutant Concentrations without Mitigation

Pollutant	*Averaging Time*	*Maximum Concentration ($\mu g/m^3$)*	*Background Concentration ($\mu g/m^3$)*	*Total Estimated Concentration ($\mu g/m^3$)*	*SCAQMD Threshold ($\mu g/m^3$)*
NO_2	State 1-hour	237	235	**472**	338
	Federal annual	25	40	66	100
	State annual	25	40	**66**	57
CO	1-hour	348	4,600	4,948	23,000
	8-hour	68	2,878	2,946	10,000
PM_{10}	24-hour	**11.5**	NA	NA	10.4
	Annual	**4.5**	NA	NA	1.0
$PM_{2.5}$	24-hour	5.5	NA	NA	10.4

Notes:
a. **Exceedances of the thresholds are indicated in bold.**
b. Reported results are from Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Planning Area 3

Construction

A proposed appealable/fill project and land use changes involving substantial terminal/backlands development would occur in Planning Area 3. Therefore, the data in Table 3.2-14 also approximate the ambient impacts that would occur from peak daily construction emissions within Planning Area 3.

Planning Area 4

Construction

The individual proposed appealable/fill projects and land use changes under the PMPU would involve only a minor amount of construction activities within Planning

Area 4. It is expected that these activities would not contribute to an exceedance of a SCAQMD ambient significance threshold.

Impact Determination

Construction

Table 3.2-14 shows that the maximum 24-hour $PM_{2.5}$ concentration increment and the maximum 1-hour and 8-hour CO concentrations would not exceed the SCAQMD thresholds. However, the maximum 24-hour and annual PM_{10} concentration increments would exceed SCAQMD significance thresholds. In addition, the maximum state 1-hour and annual NO_2 concentration, including background, would exceed the SCAQMD significance threshold. Without mitigation, these exceedances would produce significant impacts within Planning Areas 2 and 3.

Mitigation Measures

Mitigation measures **MM AQ-1 through MM AQ-8** would reduce significant levels of ambient pollutant impacts during terminal/backlands development and landfill construction. Table 3.2-15 presents the maximum ground level concentrations of NO_2, CO, PM_{10}, and $PM_{2.5}$ from peak daily and annual construction activities after mitigation. Implementation of mitigation measures **MM AQ-1 through MM AQ-8** would reduce ambient concentrations of annual NO_2 and 24-hour PM_{10} to below the SCAQMD thresholds. However, ambient concentrations of 1-hour NO_2 and annual PM_{10} would continue to exceed the SCAQMD thresholds.

Table 3.2-15. Estimated Maximum Offsite Ambient Pollutant Concentrations from Construction with Mitigation

Pollutant	*Averaging Time*	*Maximum Concentration ($\mu g/m^3$)*	*Background Concentration ($\mu g/m^3$)*	*Total Estimated Concentration ($\mu g/m^3$)*	*SCAQMD Threshold ($\mu g/m^3$)*
NO_2	State 1-hour	144	235	**380**	338
	Federal annual	16	40	56	100
	State annual	16	40	56	57
CO	1-hour	343	4,600	4,943	23,000
	8-hour	67	2,878	2,945	10,000
PM_{10}	24-hour	8.8	NA	NA	10.4
	Annual	**3.5**	NA	NA	1.0
$PM_{2.5}$	24-hour	3	NA	NA	10.4

Notes:
a. **Exceedances of the thresholds are indicated in bold.**
b. Reported results are from Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Residual Impacts

Impacts would be significant and unavoidable during construction for ambient concentrations of 1-hour NO_2 and annual PM_{10} in Planning Areas 2 and 3.

Impact AQ-3: Operations associated with the proposed Program would result in emissions that exceed a SCAQMD daily emission threshold.

This impact criterion relates only to operations, so construction impacts are not discussed in the analyses for this criterion.

Planning Area 2

Operations

Table 3.2-16 summarizes peak daily unmitigated emissions estimated for the full build-out of operations of proposed appealable/fill projects and land use changes in Planning Area 2. Peak daily emissions represent theoretical upper-bound estimates of activity levels for the Planning Area 2.

Table 3.2-16. Unmitigated Peak Daily Operational Emissions – Planning Area 2

Cargo Type/Emission Source	*Pounds per Day*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Container						
OGVs	434	814	6,998	219	136	109
Assist Tugboats	8	40	45	-	1	1
Cargo Handling Equipment	22	277	84	1	3	3
Trains	54	527	1,491	2	33	54
Trucks	156	539	1,159	5	43	26
Worker Trips	0	12	1	0	0	0
Total – Container Cargo	**674**	**2,211**	**9,779**	**228**	**217**	**170**
Liquid Bulk						
OGVs	0	1	6	5	0	0
Assist Tugboats	0	0	1	0	0	0
Cargo Handling Equipment	0	0	0	-	-	-
Trains	0	0	0	0	0	0
Trucks	0	0	0	0	0	0
Total – Liquid Bulk Cargo	**0**	**1**	**8**	**5**	**0**	**0**
Dry Bulk						
OGVs	(7)	(16)	(168)	(48)	(6)	(5)
Assist Tugboats	(3)	(17)	(32)	(0)	(1)	(1)
Cargo Handling Equipment	(1)	(5)	(13)	-	(1)	(1)
Trains	(3)	(10)	(55)	(0)	(2)	(1)
Trucks	(0)	(0)	(2)	(0)	(0)	(0)
Total – Dry Bulk Cargo	**(14)**	**(49)**	**(270)**	**(48)**	**(10)**	**(9)**
Break Bulk						
OGVs	(0.5)	(1.3)	(14.7)	(3.3)	(0.5)	(0.4)
Assist Tugboats	(0.2)	(1.0)	(1.9)	(0.0)	(0.1)	(0.1)
Cargo Handling Equipment	(0.4)	(1.8)	(5.7)	(0.0)	(0.2)	(0.2)
Trains	(0.1)	(0.3)	(1.8)	(0.0)	(0.1)	(0.0)
Trucks	(0.0)	(0.1)	(0.5)	(0.0)	(0.0)	(0.0)
Total – Break Bulk Cargo	**(1.2)**	**(4.6)**	**(24.5)**	**(3.3)**	**(0.8)**	**(0.8)**
Total Daily Emissions - Planning Area 2	**674**	**2,211**	**9,779**	**228**	**217**	**170**
SCAQMD Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Notes:
a. Emissions for container cargo assume maximum theoretical daily equipment activity levels. Such levels would rarely occur during day-to-day terminal operations. Liquid and dry bulk emissions are annual average daily rates.
b. OGV, train, truck, and worker commute emissions would occur within the SCAB.
c. OGV hoteling emissions for container operations include regional power plant emissions from AMP electricity generation.
d. Numbers in () equate to emission reductions or negative values.

The peak daily emission estimates for container cargo operations under the proposed Program include the following assumptions that were chosen to identify a maximum theoretical activity scenario for the Berths 302-306 Project:

- Ships at berth: The peak day scenario assumes that the largest combination of ships that could be simultaneously accommodated at the wharf would call at the terminal. For year 2025, this would equates to two 10,000-TEU capacity vessels arrive and hotel and two 10,000-TEU capacity vessels hotel and depart. The time each vessel is assumed to hotel equals 24 hours minus the ship's transit time between the SCAB overwater boundary and the berth; and,
- Terminal equipment: Activity, horsepower, and load factors for diesel CHE and fuel usage for LPG forklifts for a peak day would equate to between 25 and 30 percent more operating hours compared to an average day.

Planning Area 3

Operations

Table 3.2-17 summarizes peak daily unmitigated emissions estimated for the full build-out of operations of proposed appealable/fill projects and land use changes in Planning Area 3. Peak daily emissions represent theoretical upper-bound estimates of activity levels for Planning Area 3.

Table 3.2-17. Unmitigated Peak Daily Operational Emissions – Planning Area 3

Cargo Type/Emission Source	*Pounds per Day*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Container						
OGVs	1,025	1,922	16,516	518	321	257
Assist Tugboats	19	95	107	-	3	2
Cargo Handling Equipment	51	655	198	3	7	7
Trains	115	1,120	3,169	4	70	65
Trucks	201	693	1,478	6	53	33
Worker Trips	0	15	1	0	0	0
Total – Container Cargo	**1,411**	**4,500**	**21,469**	**532**	**456**	**363**
Liquid Bulk						
OGVs	(11)	(26)	(270)	(221)	(17)	(15)
Assist Tugboats	(3)	(16)	(31)	(0)	(1)	(1)
Cargo Handling Equipment	(0)	(1)	(0)	-	-	-
Trains	(1)	(3)	(15)	(0)	(0)	(0)
Trucks	(0)	(0)	(1)	(0)	(0)	(0)
Total – Liquid Bulk Cargo	**(15)**	**(47)**	**(317)**	**(221)**	**(18)**	**(16)**
Dry Bulk						
OGVs	(7)	(17)	(195)	(43)	(6)	(6)
Assist Tugboats	(2)	(13)	(25)	(0)	(1)	(1)
Cargo Handling Equipment	(5)	(25)	(76)	(0)	(3)	(3)
Trains	(1)	(4)	(24)	(0)	(1)	(1)
Trucks	(0)	(2)	(7)	(0)	(0)	(0)
Total – Dry Bulk Cargo	**(16)**	**(61)**	**(326)**	**(44)**	**(11)**	**(10)**
Total Daily Emissions - Planning Area 3	**1,381**	**4,392**	**20,826**	**267**	**426**	**337**
SCAQMD Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Notes:
a. Emissions for container cargo assume maximum theoretical daily equipment activity levels. Such levels would rarely occur during day-to-day terminal operations. Liquid bulk emissions are annual average daily rates.
b. OGV, train, truck, and worker commute emissions would occur within the SCAB.
c. OGV hoteling emissions for container operations include regional power plant emissions from AMP electricity generation.
d. Numbers in () equate to emission reductions or negative values.

Planning Area 4

Operations

Table 3.2-18 summarizes peak daily unmitigated emissions estimated for the full build-out of operations of proposed appealable/fill projects and land use changes in Planning Area 4. Peak daily emissions represent theoretical upper-bound estimates of activity levels for Planning Area 4.

Table 3.2-18. Unmitigated Peak Daily Operational Emissions – Planning Area 4

Cargo Type/Emission Source	*Pounds per Day*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Liquid Bulk						
OGVs	(1)	(2)	(16)	(13)	(1)	(1)
Assist Tugboats	(0)	(1)	(2)	(0)	(0)	(0)
Cargo Handling Equipment	(0)	(0)	(0)	-	-	-
Trains	(0)	(0)	(1)	(0)	(0)	(0)
Trucks	(0)	(0)	(0)	(0)	(0)	(0)
Total – Liquid Bulk	**(1)**	**(3)**	**(19)**	**(13)**	**(1)**	**(1)**
Break Bulk						
OGVs	5	11	125	28	4	4
Assist Tugboats	1	8	16	0	1	1
Cargo Handling Equipment	3	16	48	0	2	2
Trains	1	3	15	0	0	0
Trucks	0	1	4	0	0	0
Total – Break Bulk Cargo	**10**	**39**	**208**	**28**	**7**	**7**
Total Daily Emissions - Planning Area 4	**9**	**36**	**189**	**15**	**6**	**6**
SCAQMD Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Notes:

a. Emissions for container cargo assume maximum theoretical daily equipment activity levels. Such levels would rarely occur during day-to-day terminal operations. Liquid and break bulk emissions are annual average daily rates.
b. OGV, train, truck, and worker commute emissions would occur within the SCAB.
c. OGV hoteling emissions for container operations include regional power plant emissions from AMP electricity generation.
d. Numbers in () equate to emission reductions or negative values.

Impact Determination

Operations

The data in Tables 3.2-16 and 3-2-17 show that unmitigated emissions generated by operations of proposed appealable/fill projects and land use changes in Planning Areas 2 and 3 during a peak day would exceed the SCAQMD daily emission significance thresholds for all pollutants. The data in Table 3.2-18 also show that unmitigated NOx emissions generated by operations of proposed appealable/fill projects and land use changes in Planning Area 4 during a peak day would exceed the SCAQMD daily significance threshold. In addition, VOC emissions generated by operations of proposed appealable/fill projects and land use changes within Planning

Areas 2 and 3 would exceed the 10 tons per year annual VOC threshold. Therefore, unmitigated emissions of VOC, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ that exceed these significance thresholds during the operation of the proposed Program would be significant.

Mitigation Measures

The following mitigation measures are proposed to reduce criteria pollutant emissions from operations associated with the appealable/fill projects and land use changes under the proposed Program. Future project-level environmental documents and subsequent terminal lease agreements that would occur as part of the proposed Program would include these mitigation measures, as applicable.

Ships

MM AQ-9: Alternative Maritime Power

Container and passenger vessels calling at the Port shall use AMP at the following percentages while hoteling. The maximum compliance rate of 95 percent by year 2026 is consistent with the goal of CAAP measure OGV2:

- 2017: 70 percent of total ship calls; and,
- 2026: 95 percent of total ship calls.

While the Port is expected to meet 95 percent AMP, certain events such as equipment failure may mean less than 95 percent of ships would comply with this measure in certain years (the Port expects compliance to be 92 to 93 percent in such cases). A compliance rate reduction of 2 to 3 percent would not affect significance findings in this analysis.

Use of AMP would enable ships to turn off their auxiliary engines during hoteling, leaving the boiler as the only source of direct emissions. An increase in regional power plant emissions associated with AMP electricity generation is also assumed. Including the emissions from ship boilers and regional power plants, a ship hoteling with AMP reduces its criteria pollutant emissions 71 to 93 percent, depending on the pollutant, compared to a ship hoteling without AMP and burning residual fuel in the boilers.

MM AQ-10: Vessel Speed Reduction Program

All ships calling at the Port shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area in the following implementation schedule:

- 2014 and thereafter: 95 percent.

This mitigation measure would require shippers to increase their VSRP compliance rates to higher than current levels. 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 cruise speed of 24 knots, a reduction in speed to 12 knots reduces the main engine load factor from 83 to 10 percent, due to the cubic relationship of load factor to speed. The corresponding

reduction in overall transit emissions from the main engine from the SCAQMD overwater boundary to berth is approximately 19 percent for VOC, 37 percent for CO, 56 percent for NO_x, 58 percent for SO_x, and 53 percent for PM_{10}.

MM AQ-11: Cleaner OGV Engines

Tenants shall seek to maximize the number of vessels calling at the Port that meet the IMO NO_x limit of 3.4 g/kW-hr. The IMO Tier 2 NO_x standards came into effect January 1, 2011 for new vessels. IMO Tier 3 NO_x standards will become effective January 1, 2016 for new vessels operating in Emission Control Areas. When ordering new ships bound for the Port, the purchaser shall confer with the ship designer and engine manufacturer to determine the feasibility of incorporating all emission reduction technology and/or design options.

On an individual OGV basis, a 15 percent reduction in NO_x emissions would result from compliance with the IMO Tier 2 standard compared to Tier 1 standard and an 80 percent reduction in NO_x emissions would result from compliance with the IMO Tier 3 standard compared to Tier 1 standard. Due to the uncertainty of predicting the rate of project compliance with this measure, this analysis does not quantify its potential benefits. However, in July 2012 the Port began implementation of a voluntary Environmental Ship Index Program that provides incentives for operators of OGVs that accelerate DPM and NO_x emission reductions in advance of regulatory schedules. One of the incentives the Program provides is for the early introduction of OGVs with engines that meet the IMO Tiers 2 and 3 NO_x standards.

MM AQ-12: OGV Engine Emissions Reduction Technology Improvements

When using or retrofitting existing ships bound for the Port, a tenant shall determine the feasibility of incorporating all emission reduction technology and/or design options. Such technology shall be designed to reduce criteria pollutant emissions (NO_x and DPM). Some examples of potential methods for reducing emissions from large marine diesel engines include:

- Direct Water Injection;
- Fuel Water Emulsion;
- Humid Air Motor;
- Exhaust Gas Recirculation;
- Selective Catalytic Reduction;
- Continuous Water Injection; and,
- Slide Valves.

This measure focuses on reducing DPM and NO_x emissions from the existing fleet of vessels. This measure is coupled with the Port's TAP which will evaluate potential technologies. Tenants will work with the Port in their effort to streamline the evaluation process of emissions reduction technologies under the TAP and the verification process through CARB in order to achieve the greatest level of emissions reduction from OGVs as quickly as possible.

Because the effectiveness of this measure has not been established, this measure is not quantified in this study.

Yard Equipment

MM AQ-13: Yard Tractors at Terminals

By the end of 2013, all yard tractors shall meet USEPA Tier 4 nonroad or 2007 on-road emission standards.

In 2013, this measure would require all yard tractors to meet the equivalent of the Tier 4 diesel engine standards. This study assumes that this requirement would be met by replacing yard tractor engines or adding diesel emission controls to meet the equivalent of the Tier 4 diesel engine standards.

MM AQ-14: Yard Equipment at Rail Yards

All diesel-powered equipment operated at on-dock rail yards shall implement the requirements discussed below in **MM AQ-15**.

MM AQ-15: Yard Equipment at Terminals

1. All terminal equipment equipped with Tier 1 and 2 engines less than 750 hp must meet 2010 on-road or Tier 4 standards by 2012.
2. The highest available VDECs shall be installed on all Tier 3 equipment.
3. By the end of 2015: all terminal equipment equipped with Tier 3 engines shall meet USEPA Tier 4 nonroad engine standards.

For other types of terminal equipment, this measure would provide a health risk benefit if some of the equipment purchased in accordance with this measure were alternative fueled. However, this study conservatively assumed that all equipment purchased in accordance with this measure would be diesel-fueled. For diesel-fueled equipment, this measure would provide a short-term reduction in criteria pollutant emissions (roughly until 2015, although it varies by equipment type) compared to unmitigated emissions. Eventually, however, the CARB Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards (Section 3.2.3.3, State Regulations) would cause the unmitigated fleet to "catch up" to the mitigated fleet, at which point there would be no substantial difference in emissions.

Trucks

MM AQ-16: Truck Idling Reduction Measure

Within 6 months of the effective date of a lease agreement and thereafter for the remaining term of the permit and any holdover, the terminal operator shall ensure that truck idling is reduced to less than 30 minutes in total or 10 minutes at any given time while on the terminal through measures that include but are not limited to, the following.

1. The operator shall maximize the durations when the main gates are left open, including during off-peak hours (6 P.M. to 7 A.M.).
2. The operator shall implement an appointment-based system for receiving and delivering containers to minimize truck queuing (trucks lining up to enter and exit the terminal's gate).
3. The operator shall design the main entrance and exit gates to exceed the average hourly volume of trucks that enter and exit the gates (truck flow capacity) to ensure queuing is minimized.

This measure could potentially reduce on-terminal truck idling emissions at all terminals at the Port. However, since the Berths 302-306 Project design included an improved entrance, the impact on truck idling time at the gate was included in the emission calculations for both the unmitigated and mitigated scenarios.

MM AQ-17: Periodic Review of New Technology and Regulations

The LAHD shall require tenants to review, in terms of feasibility and benefits, any LAHD-identified or other new emissions-reduction technology, and report to the LAHD. Such technology feasibility reviews shall take place at the time of the LAHD's consideration of any new lease amendment or facility modification. If the technology is determined by the LAHD to be feasible in terms of cost, technical and operational feasibility, the tenant shall work with the Port to implement such technology.

Potential technologies that may further reduce emission and/or result in cost-savings benefits for the tenant may be identified through future work on the CAAP, TAP, Zero Emissions Technology Program, or terminal automation. Over the course of the lease, the tenant and the LAHD shall work together to identify potential new technologies. Such technology shall be studied for feasibility, in terms of cost, technical and operational feasibility, and emissions reduction benefits.

As partial consideration for the LAHD agreement to issue the permit to the tenant, the tenant shall implement not less frequently than once every 5 years following the effective date of the permit, new air quality technological advancements, subject to mutual agreement on operational feasibility and cost sharing, which shall not be unreasonably withheld.

The effectiveness of this measure has not been quantified in this PEIR as it depends on the advancement of new technologies and the outcome of future feasibility or pilot studies. As discussed in Section 3.2.4.1, Methodology, if the tenant requests future project changes that would require environmental clearance and a lease amendment, future CAAP mitigation measures would be incorporated into the new lease at that time.

MM AQ-18: Substitution of New Technology

If any kind of technology becomes available and is shown to be as effective as or better in terms of emissions reduction performance than the existing measure, the technology could replace the existing measure pending approval by the LAHD. The technology's emissions reductions must be verifiable through USEPA, CARB, or

other reputable certification and/or demonstration studies to the LAHD's satisfaction. The effectiveness of this measure has not been quantified in this PEIR.

Table 3.2-19 summarizes these mitigation measures and also discusses how they compare to the source-specific control measures identified in the CAAP.

Table 3.2-19. Comparison between San Pedro Bay Ports 2010 CAAP Update Control Measures and Proposed Mitigation Measures

CAAP Measure	*CAAP Measure Name*	*CAAP Measure Description*	*PEIR Mitigation Measure (MM)*	*Discussion*
Heavy-Duty Vehicles (**HDV)1**	Performance Standards for On-Road HDVs	This measure requires that all trucks servicing both ports comply with 2007 USEPA heavy-duty on-road emissions standards, in addition to safety and security requirements, by January 1, 2012. Incentives, grants, and financing were provided to support the required fleet turnover. This comprehensive program will maximize the associated emissions reductions and greatly reduce health risk concerns associated with trucks. The measure is being implemented through port tariffs and lease agreements.	**MM AQ-16: Truck Idling Reduction Measure.** Within 6 months of the effective date of the Permit, the terminal operator shall ensure that truck idling is reduced to less than 30 minutes in total or 10 minutes at any given time while on the terminal through measures that include, but are not limited to, the following: 1) operator shall maximize the durations when the main gates are left open, including during off-peak hours, 2) operator shall implement an appointment-based system for receiving and delivering containers to minimize truck queuing (trucks lining up to enter and exit the terminal's gate), and 3) operator shall design the main entrance and exit gates to exceed the average hourly volume of trucks that enter and exit the gates to ensure queuing is minimized.	**MM AQ-16** The terminal operator will be responsible for ensuring gate restrictions and tracking.
HDV2	Alternative Fuel Infrastructure for Heavy-Duty Natural Gas Vehicles	In order to encourage use of alternative fueled trucks, the ports will support development of alternative-fuel infrastructure in the port complex.	No applicable measure.	**HDV2** This will be implemented directly by the ports. The Port of Long Beach, in conjunction with the Port, recently released a Request for Proposals seeking proposals to

Table 3.2-19. Comparison between San Pedro Bay Ports 2010 CAAP Update Control Measures and Proposed Mitigation Measures

CAAP Measure	*CAAP Measure Name*	*CAAP Measure Description*	*PEIR Mitigation Measure (MM)*	*Discussion*
				design, construct and operate a public Liquid Natural Gas fueling and maintenance facility on Port property.
OGV1	OGV Vessel Speed Reduction	OGVs that call at the San Pedro Bay Ports shall not exceed 12 knots within 20 nm of Point Fermin (extending to 40 nm in the future).	**MM AQ-10: VSRP.** Vessels that call at the Port shall comply with the expanded VSRP of 12 knots within 40 nm of Point Fermin and the Precautionary Area at a rate of 95 percent starting January 1, 2014.	**MM AQ-10** complies with OGV1, which targets a 95 percent compliance rate through lease provisions.
OGV2	Reduction of At-Berth OGV Emissions	The use of shore power to reduce hoteling emissions implemented at all container and cruise terminals and one liquid bulk terminal at the Port.	**MM AQ-9: AMP.** Container and passenger ships shall use AMP while hoteling in the Port in the following percentages: 70 percent starting in 2017; 95 percent in 2026.	**MM AQ-9** complies with CAAP OGV2.
OGV3	OGV Auxiliary Engine Fuel Standards	This measure reduces emissions from the auxiliary engines and auxiliary boilers of OGVs during their approach and departure from the ports, by switching to 0.2 percent sulfur distillate fuel (MGO or MDO) within 40 nm from Point Fermin. Compliance with the CARB rule limit of 0.1 percent sulfur distillate fuel (MGO or MDO) starts on January 1, 2014.	No applicable measure.	Beginning in 2014, the requirements of CARB's OGV fuel sulfur rule remove the need for OGV3. This rule is further backstopped by the IMO ECA in 2015.
OGV4	OGV Main Engine Fuel Standards	This measure reduces emissions from main engines of OGVs during their approach and departure from the ports, by switching to 0.2 percent sulfur distillate (MGO or MDO) fuel within 40 nm from Point Fermin; Compliance with the CARB rule limit of 0.1 percent sulfur distillate fuel (MGO or MDO) starts on January 1, 2014	No applicable measure	Refer to the above discussion for OGV3.

Table 3.2-19. Comparison between San Pedro Bay Ports 2010 CAAP Update Control Measures and Proposed Mitigation Measures

CAAP Measure	*CAAP Measure Name*	*CAAP Measure Description*	*PEIR Mitigation Measure (MM)*	*Discussion*
OGV5	Cleaner OGV Engines	This measure focuses on the early introduction and preferential deployment of vessels that comply with the Annex VI NO_x and SO_x standards for ECAs into the fleet that calls at the Port and Port of Long Beach. It seeks to maximize the number of OGVs meeting the IMO NO_x limit of 3.4 g/kW-hr.	**MM AQ-11: Cleaner OGV Engines.** Targets compliance with IMO Tier 3 NO_x standards by 2016.	**MM AQ-11** fully complies with OGV5.
OGV6	OGV Engine Emission Reduction Technology Improvements	This measure seeks to encourage demonstration and deployment of cleaner OGV engine technologies that are validated through the TAP or by the regulatory agencies. The goal of this measure is to reduce DPM and NO_x emissions of in-use vessels.	**MM AQ-12: OGV Engine Emission Reduction Technology Improvements.** Seeks to reduce emissions from large marine diesel engines using new technologies developed through the TAP including: selective catalytic reduction technology, direct water injection, exhaust gas recirculation fuel water emulsion, in-line fuel emulsification technology, humid air motor, diesel particulate filters or exhaust scrubbers exhaust gas recirculation, common rail selective catalytic reduction, low NO_x burners for boilers, continuous water injection, implement fuel economy standards by vessel class and engine slide valves.	**MM AQ-12** fully complies with OGV6.
CHE1	Performance Standards for CHE	By the end of 2010, all yard tractors will meet, at a minimum, the USEPA 2007 on-road or Tier 4 off-road standards. By the end of 2012, all pre-2007 on-road or pre-2004 off-road top picks, forklifts, reach stackers, RTG cranes, and straddle carriers ≤ 750 hp will meet at a	**MM AQ-13: Yard Tractors.** All yard tractors operated at terminals with new leases shall meet USEPA Tier 4 nonroad or 2007 on-road emission standards by the end of 2013.	**MM AQ-13** complies with CHE1.
			MM AQ-14: Yard Equipment (Terminal).	**MM AQ-14** complies with CHE1.

Table 3.2-19. Comparison between San Pedro Bay Ports 2010 CAAP Update Control Measures and Proposed Mitigation Measures

CAAP Measure	*CAAP Measure Name*	*CAAP Measure Description*	*PEIR Mitigation Measure (MM)*	*Discussion*
		minimum the USEPA 2007 on-road or Tier 4 off-road engine standards. By the end of 2015, all CHE with engines >750hp will meet at a minimum the USEPA Tier 4 off-road engine standards. Until equipment is replaced with Tier 4, all CHE with engines >750hp will be equipped with the cleanest available VDECs.	1) By the end of 2012, all terminal equipment less than 750 hp other than yard tractors shall meet the USEPA Tier 4 on-road or Tier 4 nonroad engine standards. 2) The highest VDECS available must be installed on all Tier 3 equipment by the end of 2012. 3) By the end of 2015, all Tier 3 terminal equipment other than yard tractors shall meet 2010 on-road standards.	
			MM AQ-15: Yard Equipment (Rail Yard). Equivalent to MM AQ-14.	**MM AQ-15** complies with CHE1.
HC1	Performance Standards for Harbor Craft	All harbor craft operating in the Port and Port of Long Beach are required to comply with the CARB harbor craft regulation. In addition, by 2008 all harbor craft home-ported in the San Pedro Bay will meet USEPA Tier 2 standards for harbor craft, or equivalent reductions. After Tier 3 engines become available between 2009 and 2014, within 5 years all harbor craft home-based in the San Pedro Bay will be repowered with the new engines. All tugs will use shore power while at their home port location.	No mitigation assumed.	This measure is a Port-wide measure. Terminal operators and shipping lines do not have a direct contractual relationship with tugboat operators and may be limited in providing the infrastructure necessary to implement HC1. The Port and Port of Long Beach shall implement HC1 through a Port-wide Program as described in the CAAP. The Project air quality analysis assumes that a portion of the Port tugboat fleet will be re-powered through the CARB Carl Moyer Program.
RL1	Pacific Harbor Line Rail Switch Engine Modernization	This measure will be implemented through the second amendment to the operating agreement between the Port, the Port of Long Beach, and PHL. By 2008, all existing switch engines in the ports have been replaced with at least Tier 2 engines and will use emulsified fuels as	No mitigation assumed.	

Table 3.2-19. Comparison between San Pedro Bay Ports 2010 CAAP Update Control Measures and Proposed Mitigation Measures

CAAP Measure	*CAAP Measure Name*	*CAAP Measure Description*	*PEIR Mitigation Measure (MM)*	*Discussion*
		available or other equivalently clean alternative diesel fuels. Any new switch engine acquired after the initial replacement must meet USEPA Tier 3 standards or a NO_x standard of 3 g/bhp-hr and a DPM standard of 0.0225 g/bhp-hr. All switch engines will have 15-minute idling limit devices installed and operational.		
RL2	Class 1 Line-haul and Switcher Fleet Modernization	Effects only existing Class 1 railroad operations on Port property. Lays out stringent goals for switcher, helper, and long haul locomotives operating on Port properties. By June 30, 209, phase out all non-essential idling. But January 1, 2007, use of ultra-low sulfur diesel fuels in 80 percent of the locomotives. By 2010, all Class I locomotives in the SCAB will on the average meet emissions equivalent to Tier 2 standards. By 2023, all Class I locomotives entering the Port will meet emissions equivalent to Tier 3 standards.	No mitigation assumed.	RL2 affects only existing Class 1 rail yards (Class I rail yards are BNSF and UP). The Port and Port of Long Beach shall implement RL2 through a Port-wide Program as described in the CAAP. The Port is meeting with the Class I rail yards to discuss implementation of the Port-wide Program RL3 effects all new or redeveloped rail yards. Mitigation for the Project on-dock rail yard is applied under RL3 below.
RL3	New and Redeveloped Near-Dock Rail Yards	New rail facilities, or modifications to existing rail facilities located on Port property, will incorporate the cleanest locomotive technologies, meet the requirements specified in CAAP measure RL2, utilize "clean" CHE and HDV, and utilize available "green-container" transport systems.	No mitigation assumed.	The Project analysis assumes on-dock rail yards remain at their current physical capacities.

Tables 3.2-20 and 3.2-21 present mitigated peak daily emissions estimated for the full build-out of operations related to proposed appealable/fill projects and land use changes in Planning Areas 2 and 3 due to the implementation of **MM AQ-9 through MM AQ-16**. In most cases, the mitigation effectiveness of these measures on peak daily emissions is similar to that on average daily emissions. The effects of **MM AQ-11, MM AQ-12, and MM AQ-16** were not included in the emission calculations, due to the uncertainties of predicting future compliance levels with these measures.

MM AQ-17 and MM AQ-18 may further reduce future emissions. However, because implementation may change over the life of the proposed Program, the effects of these measures also were not included in the calculation of mitigated emissions. A mitigated emissions analysis was not performed for operations within Planning Area 4, since specific source activity data for these operations were not used in this PEIR. Implementation of **MM AQ-9 through MM AQ-18** also would reduce proposed NOx emissions from these operations in Planning Area 4, although they would continue to exceed the SCAQMD daily significance threshold.

Table 3.2-20. Mitigated Peak Daily Operational Emissions – Planning Area 2

Cargo Type/Emission Source	*Pounds per Day*					
	VOC	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Container						
OGVs	448	791	5,607	171	118	93
Assist Tugboats	8	40	45	-	1	1
CHE	22	282	85	1	4	3
Trains	54	527	1,491	2	33	54
Trucks	156	539	1,159	5	43	26
Worker Trips	0	12	1	0	0	0
Total – Container Cargo	**688**	**2,192**	**8,389**	**180**	**199**	**154**
Liquid Bulk						
OGVs	0	1	6	5	0	0
Assist Tugboats	0	0	1	0	0	0
CHE	0	0	0	-	-	-
Trains	0	0	0	0	0	0
Trucks	0	0	0	0	0	0
Total – Liquid Bulk Cargo	**0**	**1**	**8**	**5**	**0**	**0**
Dry Bulk						
OGVs	(7)	(16)	(168)	(48)	(6)	(5)
Assist Tugboats	(3)	(17)	(32)	(0)	(1)	(1)
CHE	(1)	(5)	(13)	-	(1)	(1)
Trains	(3)	(10)	(55)	(0)	(2)	(1)
Trucks	(0)	(0)	(2)	(0)	(0)	(0)
Total – Dry Bulk Cargo	**(14)**	**(49)**	**(270)**	**(48)**	**(10)**	**(9)**
Break Bulk						
OGVs	(0.5)	(1.3)	(14.7)	(3.3)	(0.5)	(0.4)
Assist Tugboats	(0.2)	(1.0)	(1.9)	(0.0)	(0.1)	(0.1)
CHE	(0.4)	(1.8)	(5.7)	(0.0)	(0.2)	(0.2)
Trains	(0.1)	(0.3)	(1.8)	(0.0)	(0.1)	(0.0)
Trucks	(0.0)	(0.1)	(0.5)	(0.0)	(0.0)	(0.0)
Total – Dry Bulk Cargo	**(1.2)**	**(4.6)**	**(24.5)**	**(3.3)**	**(0.8)**	**(0.8)**
Total Daily Emissions - Planning Area 2	**674**	**2,140**	**8,102**	**134**	**189**	**145**
SCAQMD Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

Notes:
a. Emissions for container cargo assume maximum theoretical daily equipment activity levels. Such levels would rarely occur during day-to-day terminal operations. Liquid and dry bulk emissions are annual average daily rates.
b. OGV, train, truck, and worker commute emissions would occur within the SCAB.
c. OGV hoteling emissions for container operations include regional power plant emissions from AMP electricity generation.
d. Numbers in () equate to emission reductions or negative values.

Table 3.2-21. Mitigated Peak Daily Operational Emissions – Planning Area 3

Cargo Type/Emission Source	Pounds per Day					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Container						
OGVs	1,057	1,868	13,234	404	277	220
Assist Tugboats	19	95	107	-	3	2
CHE	52	665	200	3	8	7
Trains	115	1,120	3,169	4	70	65
Trucks	201	693	1,478	6	53	33
Worker Trips	0	15	1	0	0	0
Total – Container Cargo	**1,445**	**4,456**	**18,189**	**419**	**413**	**326**
Liquid Bulk						
OGVs	(11)	(26)	(270)	(221)	(17)	(15)
Assist Tugboats	(3)	(16)	(31)	(0)	(1)	(1)
CHE	(0)	(1)	(0)	-	-	-
Trains	(1)	(3)	(15)	(0)	(0)	(0)
Trucks	(0)	(0)	(1)	(0)	(0)	(0)
Total – Liquid Bulk Cargo	**(15)**	**(47)**	**(317)**	**(221)**	**(18)**	**(16)**
Dry Bulk						
OGVs	(7)	(17)	(195)	(43)	(6)	(6)
Assist Tugboats	(2)	(13)	(25)	(0)	(1)	(1)
Cargo Handling Equipment	(5)	(25)	(76)	(0)	(3)	(3)
Trains	(1)	(4)	(24)	(0)	(1)	(1)
Trucks	(0)	(2)	(7)	(0)	(0)	(0)
Total – Dry Bulk Cargo	**(16)**	**(61)**	**(326)**	**(44)**	**(11)**	**(10)**
Total Daily Emissions - Planning Area 3	**1,414**	**4,348**	**17,545**	**154**	**384**	**300**
SCAQMD Significance Thresholds	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Notes:

a. Emissions for container cargo assume maximum theoretical daily equipment activity levels. Such levels would rarely occur during day-to-day terminal operations. Liquid bulk emissions are annual average daily rates.
b. OGV, train, truck, and worker commute emissions would occur within the SCAB.
c. OGV hoteling emissions for container operations include regional power plant emissions from AMP electricity generation.
d. Numbers in () equate to emission reductions or negative values.

The data in Tables 3.2-20 and 3.2-21 show that mitigated emissions from operations of proposed appealable/fill projects and land use changes in Planning Areas 2 and 3 during a peak day would exceed all SCAQMD daily emission thresholds, except that activities in Planning Area 2 would not exceed the SOx threshold. In addition, mitigated VOC emissions generated by these operations would exceed the 10 tons per year annual VOC threshold. Mitigated emissions from operations of proposed appealable/fill projects and land use changes in Planning Area 4 during a peak day also would exceed the NOx SCAQMD daily emission thresholds. Therefore, mitigated emissions that exceed these thresholds from operations within a planning area would be significant.

Residual Impacts

Mitigated emissions of VOC, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ from operations associated with the proposed Program during a peak day would remain significant and unavoidable.

Impact AQ-4: Operations associated with the proposed Program would result in ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.

This impact criterion only relates to operations, so construction impacts are not discussed in the analyses for this criterion.

Planning Area 2

Operations

Tables 3.2-22 and 3.2-23 summarize the results of a dispersion modeling analysis that estimates the maximum ambient impact of unmitigated emissions that would occur from operation of the proposed Berths 302-306 Project. The emissions data are comparable and used to approximate unmitigated ambient criteria pollutant impacts that could occur from operation of the proposed appealable/fill projects and land use changes within Planning Area 2. Table 3.2-22 presents the maximum total concentrations of CO, NO_2, and SO_2 and Table 3.2-23 presents the maximum PM_{10} and $PM_{2.5}$ concentrations that could occur during operation without mitigation.

Table 3.2-22. Estimated Maximum CO, NO_2, and SO_2 Concentrations from Operation without Mitigation

Pollutant	*Averaging Time*	*Maximum t Concentration ($\mu g/m^3$)*	*Background Concentration ($\mu g/m^3$)*	*Total Estimated Concentration ($\mu g/m^3$)[(a)]*	*SCAQMD Threshold ($\mu g/m^3$)*
NO_2	Federal 1-hour	**190**	147	**336**	188
	State 1-hour	241	235	**476**	339
	State Annual	45	40	**85**	57
	Federal Annual	45	40	85	100
SO_2	Federal 1-hour	6	53	60	196
	State 1-hour	10	228	238	655
	24-hour	0.6	32	33	105
CO	1-hour	379	4,600	4,979	23,000
	8-hour	162	2,878	3,040	10,000

Notes:
a. **Exceedances of the thresholds are indicated in bold.**
b. Reported results are from the Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Table 3.2-23. Estimated Maximum PM_{10} and $PM_{2.5}$ Concentrations from Operation without Mitigation

Pollutant	*Averaging Time*	*Maximum Estimated Concentration ($\mu g/m^3$)*	*SCAQMD Threshold ($\mu g/m^3$)*
PM_{10}	24-hour	**6.2**	2.5
	Annual	**1.9**	1.0
$PM_{2.5}$	24-hour	**5.0**	2.5

Notes:
a. **Exceedances of the threshold are indicated in bold**. The thresholds for PM10 and PM2.5 are incremental thresholds. Therefore, the incremental project concentration without background is compared to the threshold.
b. Reported results are from the Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Planning Area 3

Operations

Tables 3.2-22 and 3.2-23 summarize the results of a dispersion modeling analysis that estimates the maximum ambient impact of unmitigated emissions that would occur from operation of the Berths 302-306 Project. These data are comparable and used to approximate unmitigated ambient criteria pollutant impacts that could occur from operation of the appealable/fill projects and land use changes within Planning Area 3.

Planning Area 4

Operations

Operations of proposed appealable/fill projects and land use changes in Planning Area 4 would produce substantially lower ambient impacts compared to operations with either Planning Area 2 or 3. Impacts from unmitigated operational emissions within the planning area would not exceed any SCAQMD ambient threshold.

Impact Determination

Operations

Table 3.2-22 shows that operations of unmitigated proposed appealable/fill projects and land use changes within Planning Area 2 or 3 would produce maximum CO and SO_2 concentrations that would not exceed the SCAQMD thresholds. However, maximum ambient pollutant impacts within these planning areas would exceed the SCAQMD significance thresholds for the 1-hour NO_2 state and national standards and the annual state NO_2 standard. Table 3.2-23 also shows that operations of unmitigated proposed appealable/fill projects and land use changes within Planning Area 2 or 3 would produce maximum 24-hour and annual PM_{10} and 24-hour $PM_{2.5}$ concentrations that would exceed the SCAQMD incremental thresholds. Without mitigation, these exceedances would produce significant impacts.

Mitigation Measures

Mitigation measures **MM AQ-9 through MM AQ-18** would reduce significant levels of ambient pollutant impacts from proposed operations. Future project-level

environmental documents and subsequent terminal lease agreements that would occur as part of the proposed Program would include these mitigation measures, as applicable.

Tables 3.2-24 and 3.2-25 present the maximum concentrations of NO_2 and $PM_{10}/PM_{2.5}$ estimated for operations of proposed appealable/fill projects and land use changes within Planning Area 2 or 3 after mitigation. These data show that implementation of mitigation measures **MM AQ-9 through MM AQ-18** would reduce ambient pollutant concentrations compared to unmitigated levels. However, mitigated ambient concentrations of 1-hour and annual NO_2, 24-hour PM_{10} and $PM_{2.5}$, and annual PM10 would continue to exceed the SCAQMD thresholds.

Table 3.2-24. Estimated Maximum site NO_2 Concentrations from Operation after Mitigation

Pollutant	*Averaging Time*	*Maximum Concentration ($\mu g/m^3$)*	*Background Concentration ($\mu g/m^3$)*	*Total Estimated Concentration ($\mu g/m^3$)[(a)]*	*SCAQMD Threshold ($\mu g/m^3$)*
NO_2	Federal 1-hour	179	147	**325**	188
	State 1-hour	225	235	**460**	339
	State Annual	40	40	**80**	57

Notes:
a. **Exceedances of the thresholds are indicated in bold.**
b. Reported results are from the Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Table 3.2-25. Estimated Maximum PM_{10} and $PM_{2.5}$ Concentrations from Operation with Mitigation

Pollutant	*Averaging Time*	*Maximum Estimated Concentration ($\mu g/m^3$)*	*SCAQMD Threshold ($\mu g/m^3$)*
PM_{10}	24-hour	**5.7**	2.5
	Annual	**1.7**	1.0
$PM_{2.5}$	24-hour	**4.3**	2.5

Notes:
a. **Exceedances of the threshold are indicated in bold**. The thresholds for PM10 and PM2.5 are incremental thresholds. Therefore, the incremental project concentration without background is compared to the threshold.
b. Reported results are from the Berths 302-306 APL Container Terminal Project (Berths 302-306 Project) (LAHD and USACE 2012).

Residual Impacts

Impacts would be significant and unavoidable for ambient pollutant levels associated with the national and state 1-hour NO_2 standard, state annual NO_2 standard, 24-hour PM_{10} and $PM_{2.5}$ SCAQMD thresholds, and annual PM_{10} SCAQMD threshold.

Impact AQ-5: The proposed Program would not generate on-road traffic that would contribute to an exceedance of the 1-hour or 8-hour CO standards.

This impact criterion relates only to operations, so construction impacts are not discussed in the analyses for this criterion.

Planning Areas 2 - 4

Operations

Truck traffic generated by operations of proposed appealable/fill projects and land use changes would affect intersections predicted to operate at a poor level of service (LOS) in future years. During periods of light winds, heavily congested intersections can produce elevated levels of CO in their immediate vicinity.

The Berths 302-306 Project air quality analysis determined that proposed on-road vehicle operations would contribute to maximum 1-hour and 8-hour CO ambient impacts of 6.4 and 4.8 ppm, respectively, at the intersection of Seaside Ave and Navy Way. These impacts equate to 32 and 54 percent, respectively, of the most stringent 1-hour and 8-hour CO ambient air quality standards. The maximum number of hourly vehicle trips evaluated by the Berths 302-306 Project at this intersection was 8,085 passenger car equivalents (PCE). This level of traffic is about 10 percent higher than the maximum (existing + incremental) PCE identified for this intersection by the project traffic analysis in this PEIR (7,255 PCE). Therefore, it is expected that vehicular traffic associated with the full build-out of the proposed Program or for any individual planning area would not produce ambient CO impacts that would differ substantially from those identified for the Berths 302-306 Project.

Impact Determination

Operations

The maximum 1-hour and 8-hour CO concentrations predicted at congested roadways within the PMPU area would remain well below the applicable ambient thresholds. As a result, truck traffic from proposed Program operations would produce less than significant ambient CO impacts.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

Impact AQ-6: Operations associated with the proposed Program would not create an objectionable odor at the nearest sensitive receptor.

This impact criterion relates only to operations, so construction impacts are not discussed in the analyses for this criterion.

Planning Areas 2 – 4

Operations

Operations of proposed appealable/fill projects and land use changes would increase air pollutants due to the combustion of diesel fuel. Some individuals might find diesel combustion emissions to be objectionable in nature, although quantifying the odorous impacts to the public of these emissions is difficult. The mobile nature of most

operational emission sources would help to disperse air pollutant emissions. Additionally, the distance between proposed emission sources and the nearest residents is expected to be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels.

Impact Determination

Operations

Based on the evaluation results, the potential is low for emissions associated with the full build-out of the proposed Program or any individual planning area to produce objectionable odors that would affect a sensitive receptor. Therefore, odor impacts from operations under the proposed Program would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

Impact AQ-7: The proposed Program would expose receptors to significant levels of TACs.

Planning Area 2

Construction and Operations

Construction and operations of the proposed appealable/fill projects and land use changes due to the proposed Program would generate TACs that could affect public health. Recent LAHD CEQA/NEPA documents for the development of container terminal projects within Planning Area 2 include evaluations of public health impacts due to emissions of TACs from these actions. These documents include the China Shipping Container Terminal Project EIS/EIR and TraPac Container Terminal Project EIS/EIR. These HRAs evaluate the lifetime cancer risk and chronic and acute non-cancer effects at the maximum exposed residential, occupational, sensitive, student, and recreational receptors. The results of the HRAs performed for these projects are used to qualitatively estimate public health impacts from the proposed appealable/fill projects and land use changes within Planning Area 2 for the proposed Program. Given the programmatic nature of this PEIR, air dispersion modeling to estimate health risks from proposed construction and operations is not possible as it requires project-level specific information regarding source geometries and locations relative to receptor locations.

The maximum annual cargo throughput levels associated with the China Shipping and TraPac actions are 1,551,000 and 2,389,000 TEUs, respectively. In comparison, the maximum incremental annual cargo throughput level from PMPU operations within Planning Area 2 (full build-out minus CEQA baseline) equates to 2,238,000 TEUs.

Planning Area 3

Construction and Operations

The EIR/EIS completed for the Berths 302-306 Container Terminal Project within Planning Area 3 includes evaluations of public health impacts due to emissions of TACs from this project. The results of the HRA performed for the Berths 302-306 Project are used to approximate public health impacts from the proposed appealable/fill projects and land use changes within Planning Area 3.

The maximum annual cargo throughput level associated with the Berths 302-306 Project is 3,206,000 TEUs. In comparison, the maximum incremental annual cargo throughput level from PMPU operations within Planning Area 3 (full build-out minus CEQA baseline) equates to 5,282,000 TEUs.

Planning Area 4

Construction and Operations

The amount of TACs generated from construction and operations due to the proposed appealable/fill projects and land use changes within Planning Area 4 would be low enough that they would not exceed any SCAQMD public health threshold.

Impact Determination

Construction and Operations

The results of the China Shipping and TraPac project HRAs determined that unmitigated emissions of TACs from these actions would result in significant cancer risks and acute non-cancer effects to all receptor types. These HRAs also determined that unmitigated emissions of TACs from these actions would produce less than significant chronic non-cancer effects to all receptor types. The maximum annual cargo throughput levels between these actions and activities associated with the proposed appealable/fill projects and land use changes within Planning Area 2 are similar. Therefore, the unmitigated activities associated with proposed appealable/fill projects and land use changes within Planning Area 2 would produce 1) significant cancer risks and acute non-cancer effects, but 2) less than significant chronic non-cancer effects to all receptor types.

The results of the Berths 302-306 Project HRA determined that unmitigated emissions of TACs would result in 1) significant cancer risks to residential, occupational, and sensitive receptors and 2) significant acute non-cancer effects to residential and occupational receptors. The HRA also determined that unmitigated emissions of TACs from this project would produce less than significant impacts to all other health effects and associated receptors. The maximum annual cargo throughput levels for proposed appealable/fill projects and land use changes within Planning Area 3 would be substantially higher than the maximum annual cargo throughput level for operation of the Berths 302-306 Project. Therefore, unmitigated activities associated with proposed appealable/fill projects and land use changes within Planning Area 3 would produce 1) significant cancer risks and acute non-cancer effects to all receptor types, but 2) less than significant chronic non-cancer effects to all receptor types.

PM Morbidity & Mortality Effects

The results of dispersion modeling analyses for the Berths 302-306 Project in Table 3.2-25 show that operation of the proposed appealable/fill projects and land use changes within Planning Area 2 or 3 with mitigation could exceed the SCAQMD threshold of 2.5 $\mu g/m^3$ that the Port uses as a trigger level to quantify PM mortality and morbidity effects for CEQA purposes. However, the data in Table 3.2-25 also show that operation of the appealable/fill projects and land use changes within Planning Area 2 or 3 with mitigation would not exceed the annual $PM_{2.5}$ threshold of 5.8 $\mu g/m^3$ that CARB proposes for quantifying mortality. It would be difficult and uncertain to quantify PM mortality and morbidity effects due to activities from the proposed Program since the method used by this PEIR to describe ambient pollutant impacts focuses on identification of relative impacts and not the total aerial distribution of pollutant impacts within adjacent communities. Nevertheless, since activities associated with proposed appealable/fill projects and land use changes under the PMPU would incrementally increase ambient PM within communities adjacent to the Port, the proposed Program would result in an incremental increase in mortality and morbidity effects within the region.

Mitigation Measures

Mitigation measures **MM AQ-9 through MM AQ-18** described in the discussion of Impact AQ-3 would reduce significant levels of proposed TACs from activities associated with the proposed Program. Future project-level environmental documents would consider and include these mitigation measures, as applicable.

Results of the China Shipping and TraPac project HRAs determined that mitigated emissions of TACs from these projects would result in significant cancer risks to residential, occupational, and recreational receptors. In addition, mitigated emissions of TACs from these actions would result in significant acute non-cancer effects to all receptor types. Therefore, mitigated activities associated with proposed appealable/fill projects and land use changes within Planning Area 2 would produce 1) significant cancer risks to residential, occupational, and recreational receptors and 2) significant acute non-cancer effects to all receptor types.

The results of the Berths 302-306 Project HRA determined that implementation of mitigation measures **MM AQ-9 through MM AQ-18** would result in 1) significant cancer risks to residential, occupational, and sensitive receptors and 2) significant acute non-cancer effects to residential and occupational receptors. However, the maximum annual cargo throughput levels for proposed appealable/fill projects and land use changes within Planning Area 3 would be substantially higher than the maximum annual cargo throughput level for operation of the Berths 302-306 Project. Therefore, it is concluded that mitigated activities associated with proposed appealable/fill projects and land use changes within Planning Area 3 would produce significant 1) cancer risks and 2) acute non-cancer effects to all receptor types.

Residual Impacts

Impacts would be significant and unavoidable for 1) cancer risks and 2) acute non-cancer effects to all receptor types.

The Port and the Port of Long Beach are committed to implementing control measures through the CAAP process that will reduce air emissions and health impacts from future projects at the Ports. Currently adopted regulations and future rules proposed by the USEPA, CARB, and SCAQMD also will result in additional reductions in air emissions and associated health impacts from Port operations. The Port and the Port of Long Beach performed a Bay-wide Health Risk Assessment to quantify how implementation of the CAAP measures and future regulations to ports operations in year 2020 would reduce cancer risks within the ports region compared to a baseline year of 2005 (Port and Port of Long Beach 2009). The results of the Bay-wide Health Risk Assessment determined that even with a substantial growth in future operations at the Ports, implementation of CAAP measures and future regulations would produce substantial reductions in airborne cancer risks to the region compared to pre-CAAP conditions in 2005. All proposed appealable/fill projects and land use changes that would occur from the proposed Program would implement all applicable CAAP measures and future regulations, which also would reduce health impacts.

Impact AQ-8: The proposed Program would not conflict with or obstruct implementation of an applicable AQMP or the CAAP.

Planning Areas 2 - 4

Construction and Operations

The SCAQMD and SCAG, in cooperation with the CARB and USEPA, have developed air quality plans that are designed to bring the SCAB into attainment of the national and state ambient air quality standards. The 2012 AQMP is the current applicable air quality plan for the PMPU area. Through this attainment planning process the SCAQMD develops the *SCAQMD Rules and Regulations* to regulate sources of air pollution in the SCAB.

Construction and operations activities associated with the proposed appealable/fill projects and land use changes under the proposed Program would produce emissions of nonattainment pollutants in the form of 1) combustive emissions due to the use of fossil fuels in vessels and land-based vehicles and 2) fugitive dust emissions (PM_{10} and $PM_{2.5}$) due to the operation of vehicles on roads and exposed soils. The 2012 AQMP proposes emission reduction measures that are designed to bring the SCAB into attainment of the national and state ambient air quality standards. These attainment strategies include emission control measures and clean fuel programs that are enforced at the federal and state level on engine manufacturers and petroleum refiners and retailers. The SCAQMD also adopts control measures proposed by AQMPs into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. Activities associated with the proposed Program would comply with these regulatory requirements, such as SCAQMD Rule 403 (Fugitive Dust). The LAHD provided cargo forecasts that were used by SCAG to simulate future growth and emission scenarios in the 2012 AQMP. These cargo forecasts encompass the operational activities associated with the proposed Program. As a result, activities associated with the proposed Program would not exceed the future emission growth projections in the 2012 AQMP.

The LAHD, in conjunction with the Port of Long Beach, implements the *2010 CAAP Update*. This planning policy sets goals and implementation strategies that reduce air emissions and health risks from Port operations. The CAAP implements source-

specific performance standards for OGVs, harbor craft, trains, trucks, and terminal equipment. In addition, future projects at the Port would have to comply with the project-specific standards, as applicable, to minimize cancer risks. Operational activities associated with the proposed Program would comply with these standards and therefore would be consistent with the CAAP.

Impact Determination

Construction and Operations

Construction and operational activities associated with the proposed Program would not conflict with or obstruct implementation of the applicable air quality plan or CAAP. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

Impact GHG-1: The proposed Program would produce GHG emissions that would exceed a CEQA threshold.

Planning Areas 2 - 4

Construction and Operations

Climate change, as it relates to man-made GHG emissions, is by nature a global impact. An individual project does not generate enough GHG emissions to significantly influence global climate change by itself (Association of Environmental Professionals 2007). The issue of global climate change is, therefore, a cumulative impact. Nevertheless, for the purposes of this PEIR, the LAHD has opted to address GHG emissions as a Project-level impact. In actuality, 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.

Table 3.2-26 provides an estimate of annual GHG emissions that could occur from construction activities of proposed appealable/fill projects and land use changes within Planning Areas 2 through 4. These data are indicators of the peak annual GHGs that would occur from construction under the proposed Program. Sources of construction GHGs include dredge equipment, off-road construction equipment, on-road trucks, tug boats, marine cargo vessels used to deliver equipment to the site, and worker commute vehicles. The general landfill construction module was used to estimate annual GHGs from proposed landfill construction, as it would conservatively generate the highest amount of emissions per acre from either the general or confined landfill construction option.

Table 3.2-26. GHG Emissions from Construction Activities – Proposed Program

Planning Area/Activity	*Total Emissions (Metric Tons)*			
	CO_2	CH_4	N_2O	CO_2e
Planning Area 2				
6-Acre Landfill Construction	3,868	0.6	0.0	3,892
16-Acre Landfill Construction	10,314	1.5	0.1	10,378
Wharf Construction	2,015	0.1	0.05	2,031
Backland Construction	1,107	0.07	0.03	1,118
AMP Installation	166	0.01	0	168
Demolition	46	0	0	46
Building Construction	712	0.04	0.02	719
Reefer Area Expansion	161	0.01	0.01	162
Utility Infrastructure	127	0.01	0	128
Cranes Installation	59	0	0	59
Modify Gate	122	0.01	0	123
Worker Commute	443	0.02	0.01	446
Total GHGs - Planning Area 2	**19,139**	**2.34**	**0.25**	**19,269**
Planning Area 3				
18-Acre Landfill Construction	11,603	1.7	0.1	11,675
Terminal/Backland Developments	26,439	1.4	0.6	26,663
Total GHGs - Planning Area 3	**38,042**	**3.13**	**0.75**	**38,338**
Planning Area 4				
Terminal/Backland Developments	1,821	0.1	0.0	1,837
Total GHGs - Planning Area 4	**1,821**	**0.1**	**0.04**	**1,837**
Total GHGs - PMPU	**59,003**	**5.6**	**1.0**	**59,444**

Notes:

a. Emissions might not add precisely due to rounding.

b. One metric ton equals 1,000 kilograms, 2,205 pounds, or 1.1 U.S. (short) tons.

c. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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.

Tables 3.2-27 through 3.2-29 summarize the annual unmitigated GHG emissions that would occur in California from potential construction and operation of proposed appealable/fill projects and land use changes within Planning Areas 2 through 4. Construction emissions presented in Tables 3.2-27 through 3.2-29 are amortized over 30 years. For all cargo types, GHG emission sources include OGVs, tugboats, on-road trucks, trains, and cargo handling equipment. In addition, these data include fugitive refrigerant losses from refrigerated containers and worker commuter vehicles for container cargo operations.

Table 3.2-27. Unmitigated Annual GHG Emissions – Planning Area 2 Full Build-out

Cargo Type/Emission Source	*Metric Tons per Year CO_2e*
Construction - 30-Year Average	642
Container	
OGVs	69,062
Assist Tugboats	385
CHE	16,557
Trains	31,318
Trucks	61,399
Reefer Refrigerant Losses	987
Worker Trips	4,771
Total – Container Cargo	**184,479**
Liquid Bulk	
OGVs	1,650
Assist Tugboats	99
CHE	3
Trains	48
Trucks	8
Total – Liquid Bulk Cargo	**1,807**
Dry Bulk	
OGVs	(872)
Assist Tugboats	(189)
CHE	(69)
Trains	(321)
Trucks	(42)
Total – Dry Bulk Cargo	**(1,493)**
Break Bulk	
OGVs	(139)
Assist Tugboats	(23)
CHE	(132)
Trains	(21)
Trucks	(23)
Total – Break Bulk Cargo	**(337)**
Total GHGs - Planning Area 2	**181,878**
GHG Significance Threshold	**10,000**
Significant?	**Yes**

Notes:

a. One metric ton equals 1,000 kilograms, 2205 pounds, or 1.1 U.S. (short) tons.
b. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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; and 1,300 for HFC-134a.
c. Emissions might not add precisely due to rounding.

Table 3.2-28. Unmitigated Annual GHG Emissions – Planning Area 3 Full Build-out

Cargo Type/Emission Source	*Metric Tons per Year CO_2e*
Construction - 30-Year Average	1,278
Container	
OGVs	162,996
Assist Tugboats	909
CHE	39,077
Trains	66,550
Trucks	77,143
Reefer Refrigerant Losses	2,330
Worker Trips	11,259
Total – Container Cargo	**360,264**
Liquid Bulk	
OGVs	(6,370)
Assist Tugboats	(380)
CHE	(10)
Trains	(187)
Trucks	(30)
Total – Liquid Bulk Cargo	**(6,977)**
Dry Bulk	
OGVs	(10,116)
Assist Tugboats	(1,664)
CHE	(9,598)
Trains	(1,556)
Trucks	(1,643)
Total – Dry Bulk Cargo	**(24,577)**
Total GHGs - Planning Area 3	**329,988**
GHG Significance Threshold	**10,000**
Significant?	**Yes**

Notes:

a. One metric ton equals 1,000 kilograms, 2205 pounds, or 1.1 U.S. (short) tons.

b. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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; and 1,300 for HFC-134a.

c. Emissions might not add precisely due to rounding.

Table 3.2-29. Unmitigated Annual GHG Emissions – Planning Area 4 Full Build-out

Cargo Type/Emission Source	*Metric Tons per Year CO_2e*
Construction - 30-Year Average	61
Liquid Bulk	
OGVs	(384)
Assist Tugboats	(23)
CHE	(1)
Trains	(11)
Trucks	(2)
Total – Liquid Bulk Cargo	**(420)**
Break Bulk	
OGVs	1,180
Assist Tugboats	194
CHE	1,119
Trains	181
Trucks	398
Total – Break Bulk Cargo	**3,072**
Total GHGs - Planning Area 4	**2,713**
GHG Significance Threshold	**10,000**
Significant?	**No**

Notes:
a. One metric ton equals 1,000 kilograms, 2205 pounds, or 1.1 U.S. (short) tons.
b. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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; and 1,300 for HFC-134a.
c. Emissions might not add precisely due to rounding.

Impact Determination

Construction and Operations

Tables 3.2-27 through 3.2-29 show that future construction and operation of proposed appealable/fill projects and land use changes within Planning Areas 2 and 3 would produce annual CO_2e emissions that would exceed the CEQA threshold of 10,000 metric tons per year of CO_2e. Therefore, GHG emissions from the proposed Program would result in a significant impact. Construction and operation of proposed land use changes within Planning Area 4 would produce annual CO_2e emissions that would not exceed the CEQA threshold of 10,000 metric tons per year of CO_2e.

Mitigation Measures

Measures that reduce electricity consumption or fossil fuel use would reduce GHG emissions from activities under the proposed Program, as necessary. Construction mitigation measures that would accomplish this include **MM AQ-2 through MM AQ-4.** The operational mitigation measures proposed to reduce both criteria pollutant and TAC emissions, as applicable, (**MM AQ-9, MM AQ-10, and MM AQ-16**) also would reduce operational GHG emissions. The following additional mitigation measures specifically target GHG emissions from proposed operational activities. They were developed through an applicability and feasibility review of possible measures identified in the Climate Action Team Report to Governor Schwarzenegger and the California Legislature (Climate Action Team 2010) and the CARB Proposed Early Actions to Mitigate Climate Change in California (CARB 2007b). The strategies proposed in these two reports for the commercial/industrial sector are listed

in Table 3.2-30, along with an applicability determination for the proposed Program. Future project-level environmental documents would consider and include these mitigation measures, as applicable.

Table 3.2-30. Applicability Review of GHG Emission Reduction Strategies to the Proposed Program

Operational Strategy	*Applicability to Proposed Program*
Commercial and Industrial Design Features	
Vehicle Climate Change Standards	Regulatory measure implemented by CARB
Diesel Anti-Idling	**MM AQ-16** (truck idling); also regulatory measures implemented by CARB
Other Light-Duty Vehicle Technology	Regulatory measure implemented by CARB (standards will phase in starting 2009)
HFCs Reduction	Future regulatory measure planned by CARB
Transportation Refrigeration Units, Off Road Electrification, Port Electrification	**MM AQ-9** (AMP for ships); off-loaded refrigerated containers are electrified as part of the Project; also, a future regulatory measure is planned by CARB
Alternative Fuels: Biodiesel blends	Future regulatory measure planned by CARB
Alternative Fuel: Ethanol vehicles or enhanced ethanol/gasoline blends	Future regulatory measure planned by CARB
Heavy-Duty Vehicle Emissions Reduction Measures	**MM AQ-10** (VSRP for ships) and MM AQ-16 (truck idling); Port-wide CAAP measure HDV2 (trucks); also a regulatory measure implemented by CARB
Reduced Venting in Gas Systems	Not applicable to Project
Building Operations Strategy	
Recycling	**MM GHG-3**; also a regulatory measure implemented by the Integrated Waste Management Board
Building Energy Efficiency	**MM GHG-1, GHG-2**, and **GHG-6**; also a regulatory measure implemented by the California Energy Commission
Green Buildings Initiative	**MM GHG-1, GHG-2**, and **GHG-6**; also a future regulatory measure planned by the State and Consumer Services and CalEPA
California Solar Initiative	**MM GHG-1**; also a future regulatory measure planned by the CPUC
Note*:* These strategies are found in the California Climate Action Team's report to the Governor (Climate Action Team 2010) and CARB's *Proposed Early Actions to Mitigate Climate Change in California* (CARB 2007b).	

The following mitigation measures would reduce GHG emissions and would be implemented, as applicable, for the proposed appealable/fill projects and land use changes under the proposed Program.

MM GHG-1: Energy Efficient Light Bulbs

All interior buildings within each terminal shall exclusively use energy efficient light bulbs (compact fluorescent, light-emitting diode, or other equally efficient bulbs) for ambient lighting. Compact fluorescent and light-emitting diode bulbs produce less waste heat and use substantially less electricity than incandescent light bulbs.

MM GHG-2: Energy Audit

Tenants shall conduct an energy audit by a third party of their choice every 5 years and install innovative power saving technology 1) where it is feasible and 2) where

the amount of savings would be reasonably sufficient to cover the costs of implementation. 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 shore-side electric gantry cranes.

MM GHG-3: Recycling

Tenants shall ensure that all waste generated in all terminal buildings is recycled by a minimum of 1) 40 percent in 2014 and 2) 60 percent by 2016. Recycled materials shall include: 1) white and colored paper; 2) post-it notes; 3) magazines; 4) newspaper; 5) file folders; 6) all envelopes including those with plastic windows; 7) all cardboard boxes and cartons; 8) all metal and aluminum cans; 9) glass bottles and jars; and, 10) all plastic bottles.

In general, products made with recycled materials require less energy and raw materials to produce than products made with un-recycled 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.

MM GHG-4: Tree Planting

The applicant shall plant shade trees around the main terminal building, and the tenant shall maintain all trees through the life of the lease. Trees act as insulators from weather, thereby decreasing energy requirements. Onsite trees also provide carbon storage (Association of Environmental Professionals 2007).

MM GHG-5: Solar Panels

The LAHD shall require installation of solar panels on all future buildings constructed on LAHD property, where feasible. The LAHD, in consultation with Tenants, shall determine the feasibility of this measure as part of the review of the final tenant design plans.

MM GHG-6: Water Conservation

As part of any facility construction, a tenant shall install 1) a water recirculation system at potential wash racks, 2) low-flow devices in new buildings, and 3) low-irrigation landscaping. A tenant shall maintain these measures through the life of the lease.

Future Port-wide GHG emission reductions are also anticipated through AB 32 rule promulgation. However, these emission reductions are not available and therefore are not quantified in this PEIR.

Residual Impacts

Tables 3.2-31 and 3.2-32 summarize the mitigated annual GHG emissions that would occur within California from potential operations of proposed appealable/fill projects and land use changes within Planning Areas 2 and 3. The effects of **MM AQ-9** (AMP for Ships) **and MM AQ-10** (VSRP for ships) were included in the emission

estimates. The potential effects of the GHG mitigation measures (**MM GHG-1 through MM GHG-6**) were addressed qualitatively. A mitigated emissions analysis was not performed for these operations within Planning Area 4 since specific source activity data for these operations were not used in this PEIR. However, implementation of the above mitigation measures also would reduce proposed GHGs from these operations. Residual impacts would be significant and unavoidable.

Table 3.2-31. Mitigated Annual GHG Emissions – Planning Area 2 Full Build-out

Cargo Type/Emission Source	*Metric Tons per Year CO_2e*
Construction - 30-Year Average	642
Container	
OGVs	65,893
Assist Tugboats	385
CHE	16,557
Trains	31,318
Trucks	61,399
Reefer Refrigerant Losses	987
Worker Trips	4,771
Total – Container Cargo	**181,309**
Liquid Bulk	
OGVs	1,650
Assist Tugboats	99
CHE	3
Trains	48
Trucks	8
Total – Liquid Bulk Cargo	**1,807**
Dry Bulk	
OGVs	(872)
Assist Tugboats	(189)
CHE	(69)
Trains	(321)
Trucks	(42)
Total – Dry Bulk Cargo	**(1,493)**
Break Bulk	
OGVs	(139)
Assist Tugboats	(23)
CHE	(132)
Trains	(21)
Trucks	(23)
Total – Break Bulk Cargo	**(337)**
Total GHGs - Planning Area 2	**178,708**
GHG Significance Threshold	**10,000**
Significant?	**Yes**

Notes:
a. One metric ton equals 1,000 kilograms, 2205 pounds, or 1.1 U.S. (short) tons.
b. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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; and 1,300 for HFC-134a.
c. Emissions might not add precisely due to rounding.

Table 3.2-32. Mitigated Annual GHG Emissions – Planning Area 3 Full Build-out

Cargo Type/Emission Source	*Metric Tons per Year CO_2e*
Construction - 30-Year Average	1,278
Container	
OGVs	155,516
Assist Tugboats	909
CHE	39,077
Trains	66,550
Trucks	77,143
Reefer Refrigerant Losses	2,330
Worker Trips	11,259
Total – Container Cargo	**352,784**
Liquid Bulk	
OGVs	(6,370)
Assist Tugboats	(380)
CHE	(10)
Trains	(187)
Trucks	(30)
Total – Liquid Bulk Cargo	**(6,977)**
Dry Bulk	
OGVs	(10,116)
Assist Tugboats	(1,664)
CHE	(9,598)
Trains	(1,556)
Trucks	(1,643)
Total – Dry Bulk Cargo	**(24,577)**
Total GHGs - Planning Area 3	**322,508**
GHG Significance Threshold	**10,000**
Significant?	**Yes**

Notes:

a. One metric ton equals 1,000 kilograms, 2205 pounds, or 1.1 U.S. (short) tons.

b. CO_2e = the carbon dioxide equivalent emissions of all GHGs 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; and 1,300 for HFC-134a.

c. Emissions might not add precisely due to rounding.

Impact GHG-2: The proposed Program would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of GHGs.

Planning Areas 2 – 4

Construction and Operations

AB 32, signed by Governor Arnold Schwarzenegger in 2006, directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020. In accordance with AB 32, the CARB developed the Climate Change Scoping Plan (Scoping Plan), which outlines how the state will achieve the necessary GHG emission reductions to achieve this goal (CARB 2008 and 2011). The Scoping Plan includes 39 recommended actions that would reduce GHG emissions by the use of direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Two of these actions would apply to Port and PMPU operations: 1) ship electrification at ports (AMP) and 2) goods movement efficiency measures.

The City of Los Angeles implements the Green LA Plan, which is a citywide framework to confront global climate change and create a cleaner, greener, sustainable Los Angeles. The LAHD also implements a Climate Action Plan that examines opportunities to reduce GHG emissions from sources operated by the LAHD. The Climate Action Plan includes specific actions that have and/or will continue to be taken, including energy audits, green building policies, onsite photovoltaic solar energy, green energy procurement, tree planting, water conservation, alternative fuel vehicles, increased recycling, and green procurement. The document also assesses CAAP measures that offer the co-benefit of GHG reduction. Further, the LAHD implements a Green Building Policy for new buildings that would be 7,500 square feet or larger in size.

Impact Determination

Construction and Operations

Construction and operational activities associated with the PMPU would comply with all of the above-mentioned plans, policies, and regulations adopted to reduce GHG emissions. In addition, many of the GHG control measures considered in these plans, policies, and regulations are proposed as measures to mitigate GHGs from the proposed Program. These include **MM AQ-9, AQ-10, AQ-16 and GHG-1 through GHG-6**. As a result, the proposed Program would produce less than significant impacts with regards to criterion GHG-2.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

3.2.5 Summary Impact Determination

Table 3.2-33 summarizes the impact determinations of the proposed Program-related to air quality and GHGs. Identified potential impacts are based on federal, state, and City of Los Angeles significance criteria, Port criteria, and the scientific judgment of the report preparers.

For each type of potential impact, the table describes the impact, notes the CEQA impact determination, describes any applicable mitigation measures, and notes the residual impacts (i.e., the impact remaining after mitigation). All impacts, whether significant or not, are included in the table.

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
Construction			
AQ-1: Construction of the proposed Program would produce emissions that exceed a SCAQMD daily emission threshold.	Significant for VOC, CO, NO_x, PM_{10} and $PM_{2.5}$	**MM AQ-1: Harbor Craft Used During Construction.** 1. All harbor craft with C1 or C2 marine engines shall utilize a USEPA Tier-3 engine, or cleaner. This measure shall be met, unless the contractor is able to provide proof that one of the following circumstances exists: a. A piece of specialized equipment is unavailable in a controlled form, or within the required Tier level, within the state of California, including through a leasing agreement; b. A contractor has applied for necessary incentive funds to put controls on a piece of uncontrolled equipment planned for use on the project, but the application process is not yet approved, or the application has been approved, but funds are not yet available; and, c. A contractor has ordered a control device for a piece of equipment planned for use on the project, or the contractor has ordered a new piece of controlled equipment to replace the uncontrolled equipment, but that order has not been completed by the manufacturer or dealer. In addition, for this exemption to apply, the contractor must attempt to lease controlled equipment to avoid using uncontrolled equipment, but no	Significant

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		dealer within 200 miles of the project has the controlled equipment available for lease. **MM AQ-2: Cargo Ships Used During Construction.** 1. All ships & barges used primarily to deliver construction-related materials to a LAHD-contractor construction site shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area. 2. These ships also must use low-sulfur fuel (maximum sulfur content of 0.2 percent) in auxiliary engines, main engines, and boilers within 40 nm of Point Fermin. On January 1, 2014, this requirement is superseded by the CARB regulation for OGVs operating within 24 nm of the shoreline where the maximum allowable sulfur content is 0.1 percent. This mitigation measure goes above and beyond the CARB rule, as it requires 0.2 percent sulfur fuel within 40 nm from shore, whereas the CARB rule only applies to vessels within 24 nm of the shoreline, prior to January 1, 2014. In 2015, the North American ECA sulfur fuel limitation will be 0.1 percent. **MM AQ-3: Fleet Modernization for On-Road Trucks Used During Construction.** 1. Trucks hauling material such as debris or any fill material shall be fully covered while operating off LAHD property. 2. Idling shall be restricted to a maximum of 5 minutes when vehicles are not in use. 3. USEPA Standards: a. For on-road trucks with a GVWR of at least 19,500 pounds (except for Import Haulers and Earth Movers): comply with USEPA 2007 on-road emission standards for PM_{10} and NO_x (0.01 g/bhp-hr and 1.2 g/bhp-hr or better, respectively);	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		b. For Import Haulers with a GVWR of at least 19,500 pounds used to move dirt and debris to and from the construction site via public roadways: comply with USEPA 2004 on-road emission standards for PM_{10} and NO_x (0.10 g/bhp-hr and 2.0 g/bhp-hr, respectively); and, c. For Earth Movers with a GVWR of at least 19,500 pounds used to move dirt and debris within the construction site: Comply with USEPA 2004 on-road emission standards for PM_{10} and NO_x (0.10 g/bhp-hr and 2.0 g/bhp-hr, respectively). **MM AQ-4: Fleet Modernization for Construction Equipment (except Vessels, Harbor Craft and On-Road Trucks).** All dredging equipment shall be electric, unless contractor can demonstrate that such equipment is not feasible for a specific activity. 1. Construction equipment shall incorporate, where feasible, emissions-savings technology such as hybrid drives and specific fuel economy standards. 2. Idling shall be restricted to a maximum of 5 minutes when not in use. 3. Equipment Engine Specifications: a. Prior to January 1, 2015: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emission standards at a minimum. In addition, this equipment shall be retrofitted with a CARB-verified Level 3 DECS; and, b. From January 1, 2015 on: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 4 off-road emission standards at a minimum. **MM AQ-5: Construction Best Management Practices.** Construction activities due to the proposed Program shall comply with	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		LAHD Sustainable Construction Guidelines. These general construction BMPs include: 1. Use of diesel oxidation catalysts and catalyzed diesel particulate traps; 2. Maintain equipment according to manufacturers' specifications; 3. Restrict idling of construction equipment and on-road heavy-duty trucks to a maximum of 5 minutes when not in use; 4. Install high-pressure fuel injectors on construction equipment vehicles; 5. Maintain a minimum buffer zone of 300 meters between truck traffic and sensitive receptors; 6. Enforce truck parking restrictions; 7. Provide onsite services to minimize truck traffic in or near residential areas, including, but not limited to, the following services: meal or cafeteria services, automated teller machines, etc.; 8. Re-route construction trucks away from congested streets or sensitive receptor 12 areas; 9. Provide dedicated turn lanes for movement of construction trucks and equipment on- and offsite; and, 10. Use electric power in favor of diesel power where available. **MM AQ-6: Additional Fugitive Dust Controls.** The project construction contractor shall obtain a Rule 403 Permit from SCAQMD prior to construction. The following measures shall be included in the contractor's Fugitive Dust Control Plan to enable fugitive dust emission reductions of at least 90 percent compared to uncontrolled levels: 1. All projects shall follow the SCAQMD BACT measures, as outlined in Table 1 in Rule 403. Large construction projects (on a property which contains 50 or more disturbed acres) shall also follow Rule 403 Tables 2 and 3; 2. Active grading sites shall be watered three times per day;	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		3. Contractors shall apply approved non-toxic chemical soil stabilizers to all inactive construction areas or replace groundcover in disturbed areas; 4. Contractors shall provide temporary wind fencing around sites being graded or cleared; 5. Trucks hauling dirt, sand, or gravel shall be covered or shall maintain at least 2 feet of freeboard in accordance with Section 23114 of the California Vehicle Code (*Spilling Loads on Highways*); 6. Construction contractors shall 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; 7. The grading contractor shall suspend all soil disturbance activities when winds exceed 25 mph or when visible dust plumes emanate from a site. If construction is delayed, disturbed areas shall be stabilized; 8. Open storage piles (greater than 3 feet tall and a total surface area of 150 square feet) shall be covered with a plastic tarp or chemical dust suppressant; 9. Materials shall be stabilized while loading, unloading and transporting to reduce fugitive dust emissions; 10. Belly-dump truck seals shall be checked regularly to remove trapped rocks to prevent possible spillage; and, 11. Projects shall comply with track-out regulations and provide water while loading and unloading to reduce visible dust plumes. **MM AQ-7: General Mitigation Measure.** For any of the above mitigation measures (**MM AQ-1 through MM AQ-6**), if a CARB-certified technology becomes available and is shown to be as effective as or better in terms of emissions performance than the	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		existing measure, the technology would replace the existing measure pending approval by the LAHD. Measures shall be set at the time a specific construction contract is advertised for bids. **MM AQ-8: Special Precautions near Sensitive Sites.** All construction activities located within 1,000 feet of sensitive receptors (defined as schools, playgrounds, daycares, and hospitals) shall notify each of these sites in writing at least 30 days before construction activities begin.	
AQ-2: Construction of the proposed Program would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.	Significant for 1-hour and annual NO_2 and 24-hour and annual PM_{10}	**MM AQ-1 through MM AQ-8.**	Significant for 1-hour NO_2 and annual PM_{10}
Operations			
AQ-3: Operation of the proposed Program would result in emissions that exceed a SCAQMD daily emission threshold and the VOC 10 tons per year Threshold.	Significant for VOC, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$	**MM AQ-9: Alternative Maritime Power.** Container and passenger vessels calling at the Port shall use AMP at the following percentages while hoteling. The maximum compliance rate of 95 percent by year 2026 is consistent with the goal of CAAP measure OGV2: 2017: 70 percent of total ship calls; and, 2026: 95 percent of total ship calls. **MM AQ-10: Vessel Speed Reduction Program.** All ships calling at the Port shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area in the following implementation schedule: 2014 and thereafter: 95 percent. **MM AQ-11: Cleaner OGV Engines.** Tenants shall seek to maximize the number of vessels calling at the Port that meet the IMO NO_x limit of 3.4 g/kW-hr. The IMO Tier 2 NO_x standards came into effect January 1, 2011 for new vessels. IMO Tier 3 NO_x standards will become effective January 1, 2016 for new vessels operating in Emission Control Areas. When	Significant

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		ordering new ships bound for the Port, the purchaser shall confer with the ship designer and engine manufacturer to determine the feasibility of incorporating all emission reduction technology and/or design options. **MM AQ-12: OGV Engine Emissions Reduction Technology Improvements.** When using or retrofitting existing ships bound for the Port, a tenant shall determine the feasibility of incorporating all emission reduction technology and/or design options. Such technology shall be designed to reduce criteria pollutant emissions (NO_x and DPM). Some examples of potential methods for reducing emissions from large marine diesel engines include: Direct Water Injection; Fuel Water Emulsion; Humid Air Motor; Exhaust Gas Recirculation; Selective Catalytic Reduction; Continuous Water Injection; and, Slide Valves. **MM AQ-13 Yard Tractors at Terminals**. By the end of 2013, all yard tractors shall meet USEPA Tier 4 nonroad or 2007 on-road emission standards. **MM AQ-14: Yard Equipment at Rail Yards.** All diesel-powered equipment operated at on-dock rail yards shall implement the requirements discussed in MM AQ-15. **MM AQ-15: Yard Equipment at Terminals.** 1. All terminal equipment equipped with Tier 1 and 2 engines less than 750 hp must meet 2010 on-road or Tier 4 standards by 2012. 2. The highest available VDECs shall be installed on all Tier 3 equipment. 3. By the end of 2015: all terminal equipment equipped with Tier 3	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		engines shall meet USEPA Tier 4 nonroad engine standards. **MM AQ-16: Truck Idling Reduction Measure.** Within 6 months of the effective date of a lease agreement and thereafter for the remaining term of the permit and any holdover, the terminal operator shall ensure that truck idling is reduced to less than 30 minutes in total or 10 minutes at any given time while on the terminal through measures that include but are not limited to, the following. 1. The operator shall maximize the durations when the main gates are left open, including during off-peak hours (6 P.M. to 7 A.M.). 2. The operator shall implement an appointment-based system for receiving and delivering containers to minimize truck queuing (trucks lining up to enter and exit the terminal's gate). 3. The operator shall design the main entrance and exit gates to exceed the average hourly volume of trucks that enter and exit the gates (truck flow capacity) to ensure queuing is minimized. **MM AQ-17: Periodic Review of New Technology and Regulations.** The LAHD shall require tenants to review, in terms of feasibility and benefits, any LAHD-identified or other new emissions-reduction technology, and report to the LAHD. Such technology feasibility reviews shall take place at the time of the LAHD's consideration of any new lease amendment or facility modification. If the technology is determined by the LAHD to be feasible in terms of cost, technical and operational feasibility, the tenant shall work with the LAHD to implement such technology. Potential technologies that may further reduce emission and/or result in cost-savings benefits for the tenant may be identified through future	

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		work on the CAAP, TAP, Zero Emissions Technology Program, or terminal automation. Over the course of the lease, the tenant and the LAHD shall work together to identify potential new technologies. Such technology shall be studied for feasibility, in terms of cost, technical and operational feasibility, and emissions reduction benefits. As partial consideration for the LAHD agreement to issue the permit to the tenant, the tenant shall implement not less frequently than once every 5 years following the effective date of the permit, new air quality technological advancements, subject to mutual agreement on operational feasibility and cost sharing, which shall not be unreasonably withheld. **MM AQ-18: Substitution of New Technology.** If any kind of technology becomes available and is shown to be as effective as or better in terms of emissions reduction performance than the existing measure, the technology could replace the existing measure pending approval by the LAHD. The technology's emissions reductions must be verifiable through USEPA, CARB, or other reputable certification and/or demonstration studies to the LAHD's satisfaction.	
AQ-4: Operation of the proposed Program would result in ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.	Significant for national and state 1-hour and state annual NO_2, 24-hour and annual PM_{10}, and 24-hour $PM_{2.5}$	**MM AQ-9 through MM AQ-18**	Significant
AQ-5: Operation of the proposed Program would not generate on-road traffic that would contribute to an exceedance of the 1-hour or 8-hour CO standards.	Less than significant	No mitigation is required	Less than significant

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
AQ-6: Operation of the proposed Program would not create an objectionable odor at the nearest sensitive receptor.	Less than significant	No mitigation is required	Less than significant
AQ-7: Operation of the proposed Program would expose receptors to significant levels of TACs.	Significant cancer risks and acute non-cancer effects for all receptor types.	**MM AQ-9 through MM AQ-18**	Significant.
AQ-8: Operation of the proposed Program would not conflict with or obstruct implementation of an applicable AQMP or the CAAP.	Less than significant	No mitigation is required	Less than significant
GHG-1: Operation of the proposed Program would produce GHG emissions that would exceed a CEQA threshold.	Significant	**MM AQ-2 through MM AQ-4, MM AQ-9, MM AQ-10, MM AQ-16**, and **MM GHG-1: Energy Efficient Light Bulbs.** All interior buildings within each terminal shall exclusively use energy efficient light bulbs (compact fluorescent, light-emitting diode, or other equally efficient bulbs) for ambient lighting. **MM GHG-2: Energy Audit.** Tenants shall conduct an energy audit by a third party of their choice every 5 years and install innovative power saving technology 1) where it is feasible and 2) where the amount of savings would be reasonably sufficient to cover the costs of implementation. 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 shore-side electric gantry cranes. **MM GHG-3 Recycling.** Tenants shall ensure that all waste generated in all terminal buildings is recycled by a minimum of 1) 40 percent in 2014 and 2) 60 percent by 2016. Recycled materials shall include 1) white and colored paper; 2) post-it notes; 3) magazines; 4) newspaper; 5) file folders; 6) all envelopes including those with plastic windows; 7) all cardboard boxes and cartons; 8) all	Significant

Table 3.2-33. Summary Matrix of Potential Impacts and Mitigation Measures for Air Quality and GHGs Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impact After Mitigation*
		metal and aluminum cans; 9) glass bottles and jars; and, 10) all plastic bottles. **MM GHG-4: Tree Planting.** The applicant shall plant shade trees around the main terminal building, and the tenant shall maintain all trees through the life of the lease. **MM GHG-5: Solar Panels.** The LAHD shall require installation of solar panels on all future buildings constructed on LAHD property, where feasible. The LAHD, in consultation with Tenants, shall determine the feasibility of this measure as part of the review of the final tenant design plans. **MM GHG-6: Water Conservation.** As part of any facility construction, a tenant shall install 1) a water recirculation system at potential wash racks, 2) low-flow devices in new buildings, and 3) low-irrigation landscaping. A tenant shall maintain these measures through the life of the lease.	
GHG-2: Operation of the proposed Program would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of GHGs	Less than significant	No mitigation is required	Less than significant

3.2.6 Significant Unavoidable Impacts

After mitigation, daily emissions from construction under the proposed Program would exceed the SCAQMD daily emission thresholds for VOC, CO, NO_x, PM_{10} and $PM_{2.5}$. These exceedances would be significant and unavoidable.

Ambient pollutant impacts from mitigated construction activities under the proposed Program would exceed the 1-hour NO_2 and annual PM_{10} SCAQMD thresholds. These impacts would be significant and unavoidable.

After mitigation, peak daily emissions from operations under the proposed Program would exceed the SCAQMD daily emission thresholds for VOC, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$. These exceedances would be significant and unavoidable.

Ambient pollutant impacts from mitigated operational activities under the proposed Program would exceed the 1) national and state 1-hour and annual NO_2, 2) 24-hour

and annual PM_{10}, and 3) 24-hour $PM_{2.5}$ SCAQMD thresholds. These impacts would be significant and unavoidable.

Ambient TAC impacts from mitigated operational activities under the proposed Program would produce 1) cancer risks to all receptors that would exceed the significance threshold of 10 in 1 million (10×10^{-6}) and 2) acute non-cancer effects to all receptors that would exceed the health hazard index of 1.0. These impacts would be significant and unavoidable.

After mitigation, GHG emissions from the proposed Program would contribute to significant and unavoidable impacts to global climate change.

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