# Section 3.1
# Air Quality and Meteorology

## SECTION SUMMARY

This section describes existing air quality and meteorology within the Port, potential impacts on air quality and human health associated with operation of the Revised Project, and mitigation measures.

Section 3.1, Air Quality and Meteorology, provides the following:

- a description of existing air quality in the Port area;
- a discussion on the methodology used to determine whether the Revised Project would result in a new or substantially more severe significant impact on air quality from air emissions;
- an impact analysis of the Revised Project;
- a description of mitigation measures proposed to reduce potential impacts, as applicable; and
- a comparison of those mitigation measures and residual impacts to the suite of original mitigation measures in the FEIR.

**Key Points of Section 3.1:**

The Recirculated Draft SEIR for the Revised Project is focused on evaluating impacts for the continued operation of the Berths 97-109 CS Container Terminal under a set of proposed revised mitigation measures. Since all construction and physical improvements to the CS Container Terminal have been completed and are in operation as approved based on the 2008 EIS/EIR, this Recirculated Draft SEIR focuses on the impacts of the alterations to mitigation measures which constitute the Revised Project. Additionally, this Recirculated Draft SEIR, in evaluating the impacts of operation of the CS Container Terminal under the Revised Project, assumes and analyzes impacts of an incremental increase in the Terminal's throughput level in future years, based upon reassessment of terminal capacity, compared to the assumptions in the 2008 EIS/EIR.

Air quality operational mitigation measures MM AQ-9, MM AQ-10, MM AQ-15, and MM AQ-17, identified in Section 3.1 and summarized below, are the modified mitigation measures included in the Revised Project. These measures would mitigate air quality impacts, and their effectiveness is quantified in the analysis.

> **MM AQ-9: Alternative Maritime Power.** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, all ships calling at Berths 97-109 must use AMP while hoteling in the Port, with a 95 percent compliance rate. Exceptions may be made if one of the following circumstances or conditions exists:
>
> 1. Emergencies
> 2. An AMP-capable berth is unavailable

3. An AMP-capable ship is not able to plug in
4. The vessel is not AMP-capable.

In the event one of these circumstances or conditions exist, an equivalent alternative at-berth emission control capture system shall be deployed, if feasible, based on availability, scheduling, operational feasibility, and contracting requirements between the provider of the equivalent alternative technology and the terminal operator. The equivalent alternative technology must, at a minimum, meet the emissions reductions that would be achieved from AMP.

**MM AQ-10: Vessel Speed Reduction Program (VSRP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall either 1) comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.

**MM AQ-15: Yard Tractors.** 1) No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants. 2) No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants.

**MM AQ-16 CHE at Rail Yard:** This measure is combined with MM AQ-17 below.

**MM AQ-17: Cargo-Handling Equipment.** All yard equipment at the terminal except yard tractors shall implement the following requirements:

<u>Forklifts</u>:

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2004 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2005 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 5-ton forklifts of model years 2011 or older shall be replaced with zero-emission units.
- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

Toppicks:

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2006 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2014 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

Rubber-Tired Gantries:

- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2003 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2004 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By seven years after the effective date of a new lease amendment between the Tenant and the LAHD, four RTG cranes of model years 2005 and older shall be replaced with all-electric units, and one diesel RTG crane of model year 2005 shall be replaced with a diesel-electric hybrid unit with a diesel engine that meets or is lower than Tier 4 final off-road engine emission rates for PM and NOx.

Sweepers:

- Sweeper(s) shall be alternative fuel or the cleanest available by six years after the effective date of a new lease amendment between the Tenant and the LAHD.

Shuttle Buses:

- Gasoline shuttle buses shall be zero-emission units by seven years after the effective date of a new lease amendment between the Tenant and the LAHD.

Mitigation measures listed above are used in the Revised Project emissions analysis. For purposes of the emissions estimates in this Recirculated Draft SEIR, it was assumed that the effective date of the new lease amendment is 2019; therefore, the effects of Revised Project mitigations are included in the calculations starting from 2019 based on the phasing described by each mitigation measure.

Lease measures LM AQ-1, LM AQ-2, and LM AQ-3, which are summarized below, could potentially mitigate air quality impacts but the effects of these lease measures were not quantified in the analysis.

- **LM AQ-1: Cleanest Available Cargo Handling Equipment.** Subject to zero and near-zero emissions feasibility assessments that shall be carried out by LAHD, with input from Tenant as part of the CAAP process, Tenant shall replace cargo handling equipment with the cleanest available equipment anytime new or replacement equipment is purchased, with a first preference for zero-emission equipment, a second preference for near-zero equipment, and then for the cleanest available if zero or near-zero equipment is not feasible, provided that LAHD shall conduct engineering assessments to confirm that such equipment is capable of installation at the terminal.

Starting one year after the effective date of a new lease amendment between the Tenant and the LAHD, tenant shall submit to the Port an equipment inventory and 10-year procurement plan for new cargo-handling equipment, and infrastructure, and will update the procurement plan annually in order to assist with planning for transition of equipment to zero emissions in accordance with the forgoing paragraph.

LAHD will include a summary of zero and near-zero emission equipment operating at the terminal each year as part of mitigation measure tracking.

- **LM AQ-2: Priority Access for Drayage.** A priority access system shall be implemented at the terminal to provide preferential access to zero- and near-zero-emission trucks.
- **LM AQ-3: Demonstration of Zero Emissions Equipment.** Tenant shall conduct a one-year zero emission demonstration project with at least 10 units of zero-emission cargo handling equipment. Upon completion, tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero- emission technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030.

The Revised Project would result in the following new or substantially more severe significant and unavoidable impacts compared to the Approved Project:

- Revised Project emissions of carbon monoxide (CO) would be significant in analysis years 2012, 2014, 2018 and 2023. Emissions of nitrogen oxides (NOx) would be significant in analysis years 2014, 2018, 2023, 2030 and 2036. Emissions of volatile organic compounds (VOC) would be significant in analysis years 2014 through 2045. Emissions of all other criteria pollutants would be less than significant.
- Revised Project ambient concentrations would be significant for federal 1-hour $NO_2$ in 2014 and 2018, state 1-hour $NO_2$ in 2014, annual $NO_2$ in 2014 and 2018, 24-hour $PM_{10}$ in 2014 through 2045, and annual $PM_{10}$ in 2014 through 2045. Impacts of $SO_2$, CO, and $PM_{2.5}$ would be less than significant.
- Cancer risks of the Revised Project relative to the floating Future Baseline would be significant for residential, sensitive, and occupational receptor types. Cancer risks relative to the static baseline would be less than significant. Chronic and acute non-cancer health impacts and cancer burden would be less than significant.

## 3.1.1 Introduction

Emissions from operation of the Revised Project would affect air quality in the immediate area of the Revised Project and the surrounding region. This section includes a description of the affected air quality environment, predicted impacts of the Revised Project (with increased throughput), and mitigation measures that would reduce significant impacts.

As described in Section 2, the Approved Project as analyzed in the 2008 EIS/EIR included a number of mitigation measures (summarized in Table 2-1 of Section 2), some of which have yet to be fully implemented for various reasons. The Revised Project consists of continued operation of the Berths 97-109 CS Container Terminal under new or modified mitigation measures. This Recirculated Draft SEIR further assumes that the CS Container Terminal's throughput will be incrementally higher than was assumed in the 2008 EIS/EIR, in the amounts shown in Table 2-3, due to a revised assessment of terminal capacity. Therefore, this Recirculated Draft SEIR, in analyzing the impacts of operation of the Revised Project, accounts for the impacts of both Revised Project changes to the Approved Project, and of changed circumstances surrounding, or new information of substantial importance to, the Approved Project.

As illustrated in Table 3.1-1, air quality impacts are analyzed in this Recirculated Draft SEIR against one baseline scenario: 2008 actual activity and actual compliance with 2008 EIS/EIR mitigations (the "2008 Actual Baseline"). Two future conditions (2018 to 2045) scenarios are analyzed in comparison to the 2008 Actual Baseline (the year 2018 is considered a future year because actual terminal activity data are not yet available, necessitating the use of forecasted data):

1) future conditions (2018 to 2045) assuming incremental increase in terminal throughput as shown in Table 2-3 and timely implementation of the 2008 EIS/EIR mitigation measures (referred to as the FEIR Mitigated Scenario); and
2) future conditions (2018 to 2045) assuming an incremental increase in terminal throughput as shown in Table 2-3 and implementation of the modified mitigation measures under the Revised Project (referred to as the Revised Project Scenario).

In addition, in this Recirculated Draft SEIR analysis, two past conditions ("interim years" 2012 and 2014) scenarios are analyzed in comparison to the 2008 Actual Baseline, :

1) past conditions (in "interim years" 2012 and 2014), assuming actual activity and actual compliance with 2008 EIS/EIR mitigations (referred to as the "2012 Actual and 2014 Actual" under the Revised Project Scenario) and
2) past conditions (in "interim years" 2012 and 2014) assuming actual activity but also assuming implementation of all mitigation measures required by the 2008 EIS/EIR had occurred in a timely fashion (2012 and 2014 "FEIR Mitigated" Scenarios).

Comparison of the predicted impacts from the past and future 'FEIR Mitigated Scenarios' are compared to the 2008 Actual Baseline for informational purposes only. Details of the baseline and future scenarios are provided in Chapter 2. Table 3.1-1 summarizes the analyses years and scenarios studied for Air Quality in this Recirculated Draft SEIR.

For purposes of the emissions estimates in this Recirculated Draft SEIR, it was assumed that the effective date of a new lease amendment is 2019; therefore, effects of the Revised Project proposed mitigations are assumed in the calculations of impacts starting from

2019. Analysis of 2018 under the Revised Project Scenario, by contrast, assumes projected activity in that year under the Revised Project but, since proposed mitigations would not yet be in place by then, the impacts under the Revised Project Scenario for 2018 represent actual compliance levels of 2008 EIS/EIR Mitigations, based on data for compliance levels in calendar year 2017.

**Table 3.1-1: Recirculated Draft SEIR Analysis Years and Scenarios for Air Quality Analysis**

| Scenario Referred to as | Study Year | Revised Project | | FEIR Mitigated (or simply "Mitigated") | |
|---|---|---|---|---|---|
| | | Activity | Mitigation | Activity | Mitigation |
| Actual Baseline | 2008 | Actual activity, and actual compliance of 2008 EIS/EIR mitigations | | | |
| Past Years | 2012 | actual | Actual compliance level of 2008 EIS/EIR mitigations | actual | Full compliance with 2008 EIS/EIR Mitigations |
| | 2014 | actual | | actual | |
| Future Years | 2018 | projected | | projected | |
| | 2023 | projected | Revised Project proposed mitigations (as of this Recirculated Draft SEIR) | projected | |
| | 2030 | projected | | projected | |
| | 2036 | projected | | projected | |
| | 2045 | projected | | projected | |

Due to improvements in procedures and assumptions used to calculate emissions and in atmospheric dispersion modeling procedures used to estimate resulting pollutant concentrations and consequent health impacts (which together constitute the air quality impacts of the project), it is not possible to directly compare air quality impacts presented in the 2008 EIS/EIR for the Approved Project with impacts calculated for this Recirculated Draft SEIR for the Revised Project, nor is it possible to reproduce the outdated methods, models, and procedures used to analyze air quality impacts in the 2008 EIS/EIR. Therefore, this Recirculated Draft SEIR presents an evaluation of air quality impacts for all of the baseline, past and future condition scenarios described in the preceding paragraph using current, state-of-the-art emission estimation, air quality modeling, and health risk assessment procedures, including the 2015 OEHHA HRA Guidelines.

## 3.1.2 Environmental Setting

The Revised Project is located in the Harbor District of the City of Los Angeles, within the South Coast Air Basin (SCAB). The SCAB 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.

### 3.1.2.1 Meteorological Conditions

The climate of the SCAB is classified as Mediterranean, characterized by warm, rainless 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 it is centered west of northern California. In this location, the Eastern Pacific High effectively shelters Southern California from the effects of polar storm systems. Large-scale atmospheric subsidence associated with the Eastern Pacific 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 (300 to 800 meters) above mean sea level 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 more than 15 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, which has its highest levels during the summer.

### 3.1.2.2 Wind Flow Patterns

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 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 northern side of the Palos Verdes Hills and end up as a northwest breeze in the inner harbor area. This topographic feature also deflects northeasterly land breezes that flow from the coastal plains to a more northerly direction through the Port.

### 3.1.2.3 Existing Air Quality

#### 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 by volume (ppmv 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 ozone ($O_3$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), respirable particulate matter less than 10 micrometers in diameter ($PM_{10}$), and fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). Nitrogen oxides ($NO_x$**)** and sulfur oxides ($SO_x$) refer to generic groups of compounds that include $NO_2$ and $SO_2$, respectively. These oxides are produced during combustion. Because members of these compound groups typically change rapidly from one form to another, emissions from combustion sources such as diesel engines are often stated in terms of total $NO_x$ and total $SO_x$ emissions, rather than being listed by individual compound.

EPA establishes the National Ambient Air Quality Standards (NAAQS) and defines how to demonstrate whether an area meets the NAAQS. 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.

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 3.1-2.

1 **Table 3.1-2: Adverse Effects Associated with Criteria Pollutants**

| Pollutant[d] | 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 |
| Suspended Particulate Matter less than 10 Microns ($PM_{10}$) | (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) [a] |
| Suspended Particulate Matter less than 2.5 microns ($PM_{2.5}$) | (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)[a] |
| Lead [b] | (a) Increased body burden; (b) impairment of blood formation and nerve conduction, and neurotoxin. |
| Sulfates [c] | (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 |

Source: (SCAQMD, 2007).
Notes:
[a] More detailed discussions on the health effects associated with exposure to suspended particulate matter can be found in the following documents: Office of Environmental Health Hazard Assessment's, Particulate Matter Health Effects and Standard Recommendations (OEHHA, 2002), and EPA's Air Quality Criteria for Particulate Matter, October 2004 (EPA, 2004a).
[b] Lead is not a pollutant of concern for the Revised Project.
[c] Sulfate is not a pollutant of concern for the Revised Project. SCAQMD has not established an emissions threshold for sulfates, nor does it require dispersion modeling against the localized significance thresholds.
[d] 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 Revised Project.

Of the criteria pollutants of concern, ozone is unique because it is not directly emitted from project-related sources. Rather, ozone is a secondary pollutant formed from the precursor pollutants volatile organic compounds (VOC) and $NO_x$. VOC and $NO_x$ react to form ozone in the presence of sunlight through a complex series of photochemical reactions. As a result, unlike inert pollutants, ozone levels usually peak several hours after the precursors are emitted and many miles downwind of the source. Because of the complexity and uncertainty of predicting photochemical pollutant concentrations, ozone impacts are indirectly addressed in this study by comparing Revised Project-generated emissions of VOC and $NO_x$ to daily emission thresholds set by the South Coast Air Quality Management District (SCAQMD). These emission thresholds are discussed in Section 3.1.4.3.

Generally, concentrations of photochemical pollutants, such as ozone, are highest during the summer and coincide with the season of maximum solar insolation. Concentrations of inert pollutants, such as CO, tend to be the greatest during the winter and are a product of light wind conditions and surface-based temperature inversions that are frequent during that time of year and that 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.

Because most of the Revised Project-related emission sources would be diesel-powered, diesel particulate matter (DPM) is a key pollutant evaluated in this analysis. DPM is one of the components of ambient $PM_{10}$ and $PM_{2.5}$. DPM is also classified as a TAC by 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.

## Regional Air Quality

EPA designates all areas of the United States 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. States with nonattainment areas must prepare a State Implementation Plan (SIP) that demonstrates how those areas will come into attainment. EPA currently designates the SCAB as a nonattainment area for ozone, $PM_{2.5}$ (24-hour standard), and lead (lead is not emitted by the Revised Project). In December 2012, EPA revised the $PM_{2.5}$ annual standard and issued formal area designations effective as of April, 2015. The SCAB was designated as a nonattainment area for annual average $PM_{2.5}$. In October, 2015, EPA revised the 8-hour ozone standard; formal area designations for the revised 8-hour ozone standard are due to be announced in October, 2017. The severity of nonattainment has been classified by EPA for several pollutants. EPA currently classifies the SCAB as extreme nonattainment for the 8-hour ozone NAAQS. The SCAB is in attainment/maintenance of the NAAQS for CO, $SO_2$, $NO_2$, and $PM_{10}$.

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 three years. CARB currently designates the SCAB as a nonattainment area for ozone, $PM_{10}$, $PM_{2.5}$, $NO_2$, and lead. The air basin is in attainment of the CAAQS for CO, $SO_2$, and sulfates, and is unclassified for hydrogen sulfide and visibility reducing particles (CARB, 2013).

### Local Air Quality

LAHD has been conducting its own air quality monitoring program since 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 particulate matter 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 (which indicates fossil fuel combustion sources) at the following four locations in the Port vicinity (LAHD, 2013):

- Wilmington Community Station, at the Saints Peter and Paul School. This station 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. Meteorological data from this site was used in this air quality analysis to model human health risks and criteria pollutant impacts associated with the Revised Project.
- Coastal Boundary Station, 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, at the Terminal Island Water Reclamation Plant (TITP). This site is surrounded by three terminals and has a potential to receive 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.
- San Pedro Community Station, along Harbor Boulevard near 3rd Street, adjacent to 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.

LAHD has been collecting $PM_{10}$ data since 2005 at the Wilmington Community station and since 2008 at the Coastal Boundary station, as well as $PM_{2.5}$ and elemental carbon data since 2005 at all four stations. In addition, LAHD is now collecting several gaseous pollutant (ozone, $NO_2$, $SO_2$, and CO) data at all four stations. Table 3.1-3 shows the highest pollutant concentrations recorded at the Wilmington Community Center for 2015 through 2017, the most recent complete 3-year period of data available.

**Table 3.1-3: Maximum Pollutant Concentrations Measured at the Wilmington Community Station**

| Pollutant | Averaging Period | National Standard | State Standard | Highest Monitored Concentration | | |
|---|---|---|---|---|---|---|
| | | | | 2015 [a] | 2016 [a] | 2017 [a] |
| Ozone (ppm) | 1-hour | -- | 0.09 | ***0.091*** | 0.085 | 0.088 |
| | 8-hour National [b] | 0.070 | -- | 0.066 | 0.067 | 0.064 |
| | 8-hour State | -- | 0.07 | ***0.076*** | 0.066 | 0.070 |
| CO (ppm) | 1-hour | 35 | 20 | 3.9 | 3.4 | 3.8 |
| | 8-hour | 9 | 9 | 2.4 | 2.2 | 2.3 |
| $NO_2$ (ppm) | 1-hour National [c] | 0.100 | -- | 0.068 | 0.065 | 0.065 |
| | 1-hour State | -- | 0.18 | 0.086 | 0.087 | 0.076 |
| | Annual | 0.053 | 0.030 | 0.017 | 0.015 | 0.013 |
| $SO_2$ (ppm) | 1-hour National [d] | 0.075 | -- | 0.017 | 0.017 | 0.018 |
| | 1-hour State | -- | 0.25 | 0.040 | 0.038 | 0.052 |
| | 24-hour | -- | 0.04 | 0.005 | 0.004 | 0.009 |
| $PM_{10}$ (µg/m$^3$) | 24-hour | 150 | 50 | ***56.9*** | 48.8 | **69.9** |
| | Annual | -- | 20 | **24.2** | **23.5** | **25.5** |
| $PM_{2.5}$ (µg/m$^3$) | 24-hour [e] | 35 | -- | 20.9 | 17.9 | 20.7 |
| | Annual | 12 | 12 | 8.5 | 7.3 | 8.8 |

Source:
POLA, 2016; 2017; 2018.
Notes:
Exceedances of the standards are shown in **bold/italic**. All reported values represent the highest recorded concentration during the year unless otherwise noted.
[a] Year 2015 represents the period May 2015-April 2016; year 2016 represents the period May 2016-April 2017, and year 2017 represents the period May 2017-April 2018.
[b] The monitored concentrations reported for the national 8-hour ozone standard represent the 3-year average (including the reported year and the prior 2 years) of the fourth-highest 8-hour concentration each year.
[c] The monitored concentrations reported for the national 1-hour $NO_2$ standard represent the 3-year average (including the reported year and the prior 2 years) of the 98$^{th}$ percentile of the annual distribution of daily maximum 1-hour average concentrations.
[d] The monitored concentrations reported for the national 1-hour $SO_2$ standard represent the 3-year average (including the reported year and the prior 2 years) of the 99$^{th}$ percentile of the annual distribution of daily maximum 1-hour average concentrations.
[e] The monitored concentrations reported for the national 24-hour $PM_{2.5}$ standard represent the 3-year average (including the reported year and the prior 2 years) of the 98$^{th}$ percentile of the annual distribution of daily average concentrations.

## Toxic Air Contaminants

The California Office of Environmental Health Hazard Assessment (OEHHA) identifies and studies TAC toxicity. 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 T AC sources within the SCAB include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources.

SCAQMD's *Multiple Air Toxics Exposure Study IV* (MATES IV) determined that about 68% of the background airborne cancer risk in the SCAB is due to diesel exhaust (SCAQMD, 2015a), with the highest modeled air toxics risk near the ports. Other areas of elevated risk were identified near Central Los Angeles and transportation corridors and freeways. Compared to the MATES III study, which was completed in 2008, the MATES IV study found a large decrease in carcinogenic risk, with the population-weighted risk down by 57% from the analysis in MATES III study period (2005).

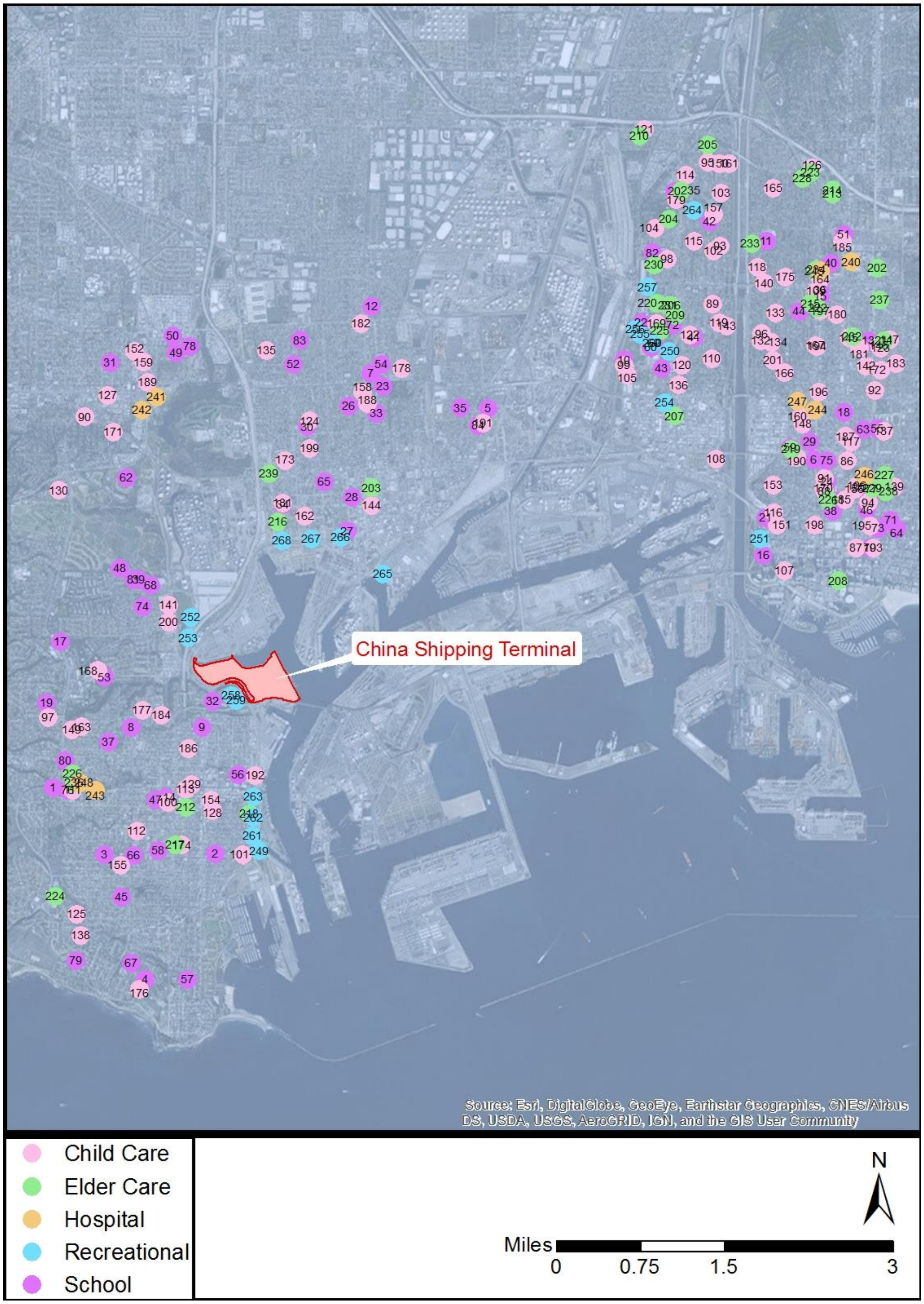
As discussed in Chapter 1, LAHD, in conjunction with the Port of Long Beach, developed the San Pedro Bay Ports (SPBP) CAAP, which targets all emissions related to the ports. In 2010 the ports released a CAAP update, with emission reduction goals for 2014 and 2023. Through 2016, the Port of Los Angeles had achieved actual reductions of 87% for DPM, 57% for $NO_x$, and 98% for $SO_x$, relative to 2005 levels as described in the 2016 Port Emissions Inventory (LAHD, 2017a). For the first time ever, the ports established uniform air quality standards at the program level, project-specific level, and the source-specific level.

In November, 2017, the ports released the 2017 CAAP Update (SPBP, 2017) which incorporates two new emission reduction targets: reduce GHGs from port-related sources to 40% below 1990 levels by 2030; and reduce GHGs from port-related sources to 80% below 1990 levels by 2050. The 2017 CAAP Update also includes the implementation of a path toward zero emissions, the next iteration of the Clean Truck Program, and innovative strategies to encourage the deployment of cleaner ships. However, as discussed in Section 3.1.3.3, below, Health and Safety Code Section 43201, enacted by SB-1 (2017), restricts the ability of CARB and other agencies to mandate the removal or retrofitting of trucks from California's public highways and roads. That restriction, by its terms, "does not apply to voluntary incentive or grant programs, including but not limited to, those that give preferential access to a facility to a particular vehicle or class of vehicles." Nevertheless, Section 43201 may complicate the ability of LAHD, alone or in conjunction with the Port of Long Beach via the CAAP, to require retirement, replacement, or retrofitting of drayage trucks in advance of CARB regulations adopted in accordance with SB-1.

## Sensitive Receptors

The impact of air emissions on sensitive members of the population is a special concern. Sensitive receptor groups include children, the elderly, and the acutely and chronically ill. The locations of these groups include schools, daycare centers, convalescent homes, and hospitals. For health risk assessment purposes, LAHD also treats recreational areas, such as parks, marinas, and public waterfront areas, as sensitive receptors. The nearest sensitive receptors to the project site are the Knoll Hill baseball fields, the Knoll Hill Dog Park, and the northern end of the San Pedro Waterfront promenade, about 0.1 mile southwest and south of the project site and the nearest residents are the Samoan Sea Apartments, on N. Harbor Boulevard, about 0.6 mile south of the project site. The nearest school is the Harbor Occupational Center on North Pacific Avenue about 0.17 miles south of the project site. The nearest daycare center is the YWCA Venture Park Pre-School, about 0.4 miles northwest of the project site. The nearest convalescent home is the Harbor View House, about 1 mile south of the project site. The nearest hospital is the San Pedro Peninsula Hospital, about 1.4 miles southwest of the project site. Figure 3.1-1 shows the locations of sensitive receptors; a table listing the name and locations of each sensitive receptor is included in Appendix B3.

**Figure 3.1-1: Sensitive Receptors**



# 3.1.3 Regulatory Setting

The Federal Clean Air Act of 1970 and its subsequent amendments established air quality regulations and the NAAQS, and delegated enforcement of these standards to the states. In California, CARB is responsible for enforcing air pollution regulations. CARB has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agencies. In the SCAB, the local air agency is SCAQMD.

The following is a summary of the key federal, state, and local air quality rules, policies, and agreements that potentially apply to the Revised Project.

## 3.1.3.1 International Regulations

### International Maritime Organization International Convention for the Prevention of Pollution from Ships Annex VI

The International Maritime Organization (IMO) International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI, which came into force in May 2005, set new international $NO_x$ emission limits on marine engines over 130 kilowatts (kW) installed on new vessels retroactive to the year 2000. In October 2008, IMO adopted amendments to international requirements under MARPOL Annex VI, which introduced $NO_x$ emission standards for new engines and more stringent fuel quality requirements (DieselNet 2013a, IMO 2008). The Annex VI North American Emission Control Area (ECA) requirements applicable to the Revised Project include:

- Caps on the sulfur content of fuel as a measure to control $SO_x$ emissions and, indirectly, PM emissions. For ECAs, the sulfur limits are capped at 1.0% starting in 2012 and 0.1% starting in 2015. The Revised Project assumes full compliance with MARPOL Annex VI $SO_x$ limits.
- $NO_x$ engine emission rate limits for new engines. Tier I and Tier I limits effective 2000 and 2011 are global limits, whereas Tier III limits, effective in 2016, apply only in $NO_x$ ECAs. $NO_x$ emission reductions due to Tier III marine engines were predicted by applying a forecast of vessel turnover developed by the Port (POLA, 2015b).

## 3.1.3.2 Federal Regulations

### State Implementation Plan

In federal nonattainment areas, the Federal Clean Air Act (CAA) requires preparation of a SIP detailing how the state will attain the NAAQS within mandated timeframes. In response to this requirement, SCAQMD, in collaboration with other agencies, such as CARB and Southern California Association of Governments (SCAG), periodically prepares an Air Quality Management Plan (AQMP) designed to bring the SCAB into attainment with federal requirements and/or to incorporate the latest technical planning information. The AQMP is then incorporated into the SIP, which is submitted by CARB to EPA for approval.

SCAQMD has prepared AQMPs in 1997, 2003, 2007, 2012, and most recently in 2016. The final 2016 AQMP was approved by the SCAQMD Governing Board on March 3, 2017. Each iteration of the AQMP is an update of the previous AQMP. The focus of the 2007 AQMP' was to demonstrate compliance with the NAAQS for $PM_{2.5}$ and 8-hour ozone and other planning requirements, including compliance with the NAAQS for $PM_{10}$ (SCAQMD, 2007). The 2007 AQMP proposed attainment of the federal $PM_{2.5}$ standards through a focused control of $SO_x$, directly emitted $PM_{2.5}$, and $NO_x$, supplemented with VOCs by 2015.

In December 2012, the SCAQMD Governing Board adopted the 2012 AQMP (SCAQMD, 2013). The 2012 AQMP focused on $PM_{2.5}$ control measures designed to attain the federal 24-hour $PM_{2.5}$ standard and contingency measures in case the targeted attainment date is missed. The 2012 AQMP also contained proposed actions to reduce ozone.

The 2016 AQMP is a comprehensive and integrated AQMP which includes new attainment demonstrations for the 2008 8-hour ozone, 2012 annual $PM_{2.5}$, and 2006 24-hour $PM_{2.5}$ standards. It also includes a report on the health impacts of PM air pollution in the South Coast Air Basin. (SCAQMD, 2016)

SIP approval lags the development and implementation of AQMPs. EPA often approves portions and disapproves other portions of submitted SIPs. CARB, and in turn SCAQMD, act to correct the deficiencies identified by EPA and resubmit the disapproved SIP portions to EPA for approval. For example, EPA approved California's 1997 SIP in 2011, excepting contingency measures. The contingency measures for the 1997 $PM_{2.5}$ SIP were finally approved by EPA in September 2013.

### EPA Emissions Standards for Marine Diesel Compression Ignition Engines—Category 1 and 2 Engines

Engine Categories are identified on the basis of engine displacement per cylinder. Category 1 engines have engine displacements per cylinder of less than 5 liters, whereas Category 2 engines have engine displacements of between 5 and 30 liters. Category 1 and 2 engines are often the auxiliary engines on large ocean going vessels (OGVs) as well as auxiliary and propulsion engines on harbor craft. To reduce emissions from these marine diesel engines, EPA established 1999 emission standards for newly built engines, referred to as *Tier 2 marine engine standards*. These standards were based on the land-based standard for non-road engines. The Tier 2 standards were phased in from 2004 to 2007 (year of manufacture), depending on the engine size.

On March 14, 2008, EPA finalized a program to reduce emissions from marine diesel Category 1 and 2 engines (73 FR 88 25098-25352). The regulations introduced Tier 3 and Tier 4 standards, which apply to both new and remanufactured diesel engines. The phase-in of Tier 3 standards began in 2009 and continued through 2014. The phase-in of Tier 3 standards for new Category 2 engines began in 2013 and continued through 2014. Tier 4 standards are being phased in for new Category 1 and 2 engines above 600 kW from 2014 to 2017. 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.

For the Revised Project, this rule is assumed to affect harbor craft but not oceangoing vessel auxiliary engines because the latter would likely be manufactured overseas and, therefore, would not be subject to the rule.

### EPA Emission Standards for Large Marine Diesel Engines—Category 3 Engines

Category 3 engines have engine displacements per cylinder greater than 30 liters. Category 3 engines are propulsion engines on OGVs. To reduce emissions from these engines, EPA established 2003 Tier 1 $NO_x$ standards for marine diesel engines above 30 liters per cylinder, large Category 3 marine propulsion engines on U.S. flagged ocean-going vessels (40 CFR Part 9 and 94) (68 FR 9745-9789). The standards went into effect for new engines built in 2004 and later. Tier 1 limits were achieved by engine-based controls, without the need for exhaust gas after-treatment.

In 2009, EPA adopted marine fuel sulfur limits and Tier 2 and Tier 3 emissions standards for newly built Category 3 engines installed on U.S. flagged vessels. The Tier 2 and 3 engines standards and fuel limits are equivalent to the amendments to MARPOL Annex VI. Tier 2 $NO_x$ standards for newly built engines apply beginning in 2011 and require the use of engine-based controls, such as engine timing, engine cooling, and advanced electronic controls. Tier 3 standards apply beginning in 2016 in ECAs and can be met with the use of high efficiency emission control technology, such as selective catalytic reduction. The Tier 2 standards are anticipated to result in a 15 to 25% $NO_x$ reduction below the Tier 1 levels; Tier 3 standards are expected to achieve $NO_x$ reductions 80% below the Tier 1 levels (DieselNet 2013). In addition to the Tier 2 and Tier 3 $NO_x$ standards, the final regulation established standards for hydrocarbon (HC) and CO.

### EPA Emission Standards for Non-Road Diesel Engines

To reduce emissions from non-road diesel equipment, EPA established a series of increasingly strict emission standards for new non-road diesel engines. Tier 1 standards were phased in on model year 1996 through 2000 equipment, Tier 2 standards were phased in on model year 2001 through 2006, Tier 3 standards were phased in on 2006 through 2008 equipment, and Tier 4 standards, which require advanced emission control technology to attain them, were phased in on model year 2008 to 2015 equipment. These standards apply to construction equipment and CHE.

### EPA Emission Standards for Locomotives

In 1997, to reduce emissions from switch and line-haul locomotives, EPA established a series of increasingly strict emission standards for new or remanufactured locomotive engines (63 FR 18997-19084). Tier 0 standards, effective as of 2000, 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.

In 2008, EPA strengthened the Tier 0 through 2 standards to apply to existing locomotives and introduced more stringent Tier 3 and 4 emission requirements (73 FR 88 25098-25352). Tier 3 standards, met by engine design methods, were phased in between 2011 and 2014. Tier 4 standards, which are expected to require exhaust gas after-treatment technologies, became effective starting in 2015 (DieselNet 2013).

### EPA Emission Standards for On-Road Trucks

Heavy-duty trucks are subdivided into three categories by the vehicle's GVWR: light heavy-duty engines (8,500 to 19,500 pounds), medium heavy-duty engines (19,500 to 33,000 pounds), and heavy heavy-duty engines (greater than 33,000 pounds).

To reduce emissions from on-road, heavy-duty diesel trucks, EPA established a series of increasingly strict emission standards for new truck engines. The 1988 through 2003 emission standards applied to truck manufactured between 1988 and 2003. In 1997, EPA adopted new emission standards for model year 2004 and later heavy-duty trucks. The goal of the 1997 regulation was to reduce $NO_x$ engine emissions to approximately 2.0 g/bhp-hr. In 2000, EPA adopted standards for PM, $NO_x$ and nonmethane hydrocarbon (NMHC) for model year 2007 and later heavy-duty highway engines and a 15 ppm limit on the sulfur content of diesel fuel. The $NO_x$ and NMHC standards were phased in between 2007 and 2010; the PM standard applied to 2008 and newer engines. The 15 ppm sulfur limit was required starting in 2006.

### EPA Non-Road Diesel Fuel Rule

With this rule, EPA set sulfur limitations for non-road diesel fuel, including locomotives and marine vessels (though not for the marine residual fuel used by very large engines on oceangoing vessels). For the Revised Project, this rule affects line-haul locomotives; the California Diesel Fuel Regulation (described below) (CARB, 2005a) generally pre-empts this rule for other sources such as yard locomotives, construction equipment, terminal equipment, and harbor craft. Under this rule, the diesel fuel used by line-haul locomotives was limited to 500 ppm starting June 1, 2007 and further limited to 15 ppm sulfur content (ultra-low-sulfur diesel) starting January 1, 2010 for non-road fuel, and June 2012 for and marine and locomotive fuels (EPA, 2004b).

### EPA and National Highway Traffic Safety Administration Medium- and Heavy-Duty Engines and Vehicles GHG Emission Standards and Fuel Economy Standards

In 2011, EPA, in conjunction with the Department of Transportations' National Highway Traffic Safety administration (NHTSA), established GHG emission standards and fuel efficiency standards for medium- and heavy-duty engines and vehicles. Final GHG emissions and fuel consumption standards apply to 2017 and newer model year vehicles.

### EPA and National Highway Traffic Safety Administration Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards

In May 2010, EPA, in conjunction with the Department of Transportation's National Highway Traffic Safety Administration (NHTSA), finalized the Light-Duty Vehicle Rule that establishes a national program consisting of greenhouse gas (GHG) emissions standards and Corporate Average Fuel Economy standards for light-duty vehicles (EPA, 2010). Light-Duty Vehicle Rule standards first apply to new cars and trucks starting with model year 2012. Although the rule is primarily designed to address GHG emissions, the fuel economy standards portion of the rule would serve to also reduce criteria pollutant emissions. On August 28, 2012, EPA and NHTSA extended the National Program of harmonized GHG and fuel economy standards to model year 2017 through 2025 passenger vehicles. The 2010 and 2012 rules affect passenger vehicles (i.e., terminal workers) and other light-duty vehicles traveling to the terminal.

### 3.1.3.3 State Regulations and Agreements

#### 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 requires 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.

#### SB-1

On April 28, 2017 Governor Brown signed into law Senate Bill 1 (SB-1). Among the changes to California state law was the addition of Health and Safety Code Section 43021. This section, in part, sets strict restrictions on the ability of the California Air Resources Board's (CARB) and other agencies to require the "…retirement, replacement, retrofitting, or repower" of commercial trucks as defined by Section 34601 of the California Vehicle Code "…until the later of the following":

(1) Thirteen years from the model year the engine and emissions control system are first certified for use in self-propelled commercial motor vehicles by the state board or other applicable state and federal agencies.

(2) When the vehicle reaches the earlier of either 800,000 vehicle miles travelled or 18 years from the model year the engine and emissions control system are first certified for use in self-propelled commercial motor vehicles by the state board or other applicable state and federal agencies.

Section 43021, by its terms, restricts the ability of CARB and other agencies to mandate the retirement, replacement, or retrofit of trucks from California's public highways and roads. The stated legislative intent of SB-1 "to provide owners of self-propelled commercial motor vehicles…certainty about the useful life of engines certified by the state board and other applicable agencies to meet required environmental standards…" Nevertheless, Section 43021, by its terms, applies only to laws or regulations adopted or amended after January 1, 2017, and "does not apply to voluntary incentive or grant programs, including but not limited to, those that give preferential access to a facility to a particular vehicle or class of vehicles."

Although the full effect of Section 43201 is not known at the time of this Draft SEIR, it may affect CARB's ability to implement its California Drayage Truck Regulations, which are discussed below. Furthermore Section 43201 may complicate the ability of LAHD to require retirement, replacement, or retrofitting of drayage trucks in advance of CARB regulations adopted in accordance with SB-1.

As the change in the law is very recent, LAHD is continuing its research into all its possible effects. Further, LAHD has already been in discussions with CARB about the law and will continue to work cooperatively in pursuant of our shared goal for cleaner air for our community.

#### AB 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 truckwaiting times to no more than 30 minutes at the Ports of Los Angeles, Long Beach, and Oakland, or face fines of $250 per violation. 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 the terminal gates to wait.

### CARB Heavy Duty Diesel Vehicle Idling Emission Reduction Regulation

This CARB rule has been in effect for heavy-duty diesel trucks in California since 2008. The rule requires that heavy-duty trucks be equipped with a non-programmable engine shutdown system that shuts down the engine after five minutes or optionally meet a stringent $NO_x$ idling emission standard (CCR Title 13, Section 1956.8 and 2485). This regulation applies to trucks used during construction and operation.

### CARB 1998 South Coast Locomotive Emissions Agreement

In 1998, CARB, Class I freight railroads operating in the SCAB (Burlington Northern and Santa Fe and Union Pacific Railroad), and EPA signed the 1998 Memorandum of Understanding (MOU) agreeing to a locomotive fleet average emissions program in the SCAQMD. The 1998 MOU requires 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 EPA 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, 1998).

### CARB 2005 Railroad Statewide Agreement

In 2005, CARB, Class I freight railroads operating in the SCAB, and EPA signed the 2005 MOU agreeing to programs 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, 2005b).

### CARB California Diesel Fuel Regulation

With this rule, CARB set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles (CCR Title 13, Sections 2281–2285; CCR Title 17, Section 93114). Harbor craft and intrastate locomotives were originally excluded from the rule, but were later included by a 2004 rule amendment (CARB, 2005a). 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. A federal diesel 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.

### CARB In-Use Off-road Diesel Vehicle Regulation

In 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 best available control technology (BACT) requirements for $NO_x$ and PM emissions by March 1 of each year (CCR Title 13, Section 2449). The rule is structured by fleet size: large, medium, and small fleets. The regulation was adopted in April 2008 and subsequently amended 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.

In September 2013, CARB received authorization from EPA to enforce the In-Use Off-road Diesel Vehicle Regulation, including the regulation's performance requirements, such as turnover requirements and restrictions on adding older, dirtier Tier 0 and 1 vehicles. Enforcement of the restrictions on adding Tier 0 and 1 vehicles began January 1, 2014. Enforcement of the first fleet average requirements for large fleets (greater than 5,000 total fleet horsepower) began on July 1, 2014.

## CARB Airborne Toxic Control Measure for Diesel-Fueled Transport Refrigeration Units, Generator Sets, and Facilities Where Transport Refrigeration Units Operate

In 2011, CARB amended the 2004 rule designed to reduce the DPM emissions from in-use TRUs) and TRU generator set engines (CCR Title 13, Section 2477). Under the rule, TRU engines are required to meet in-use performance standards by installing the required level of verified diesel emission control strategy (VDECS) or using an alternative technology. Compliance may also be maintained by replacing the engine with a cleaner new or rebuilt engine.

The in-use performance standards have two levels of stringency (Low Emission and Ultra Low Emission in-use performance standards) that are phased in per the compliance scheduled set forth in the rule.

## CARB 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, 2006a). 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 was a step in implementing the *Goods Movement Action Plan (GMAP)* developed by the California Business, Transportation, and Housing Agency (BTH) and Cal/EPA. The final GMAP 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.

### CARB Regulations for Fuel Sulfur and Other Operational Requirements for OGVs within California Waters and 24 Nautical Miles of the California Baseline

In July 2008, CARB approved the Regulation for Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline (CCR Title 13, Section 2299.2). These regulations have required ship main engines, auxiliary engines, and auxiliary boilers operating in California waters since July 2009 to either use MDO with a maximum sulfur content of 0.5% or MGO with a maximum sulfur content of 1.5%. By August 1, 2012, these source activities were required to meet an MDO limit of 0.5% or MGO limit of 1.0%. By

January 1, 2014, these source activities were required to meet an MDO or MGO sulfur limit of 0.1%.

### CARB Regulation to Reduce Emissions from Diesel Auxiliary Engines on OGVs While at Berth at a California Port

In December 2007, CARB adopted a regulation to reduce emissions from diesel auxiliary engines on OGVs while at berth for container, cruise, and refrigerated cargo vessels (CCR Title 17, Section 93118.3). The regulation requires that auxiliary diesel engines on OGVs be shut down for specified percentages of fleet's visits and also for the fleet's at-berth auxiliary engine power generation to be reduced by the same percentages. By 2014, vessel operators are required to shut down their auxiliary engines at berth for 50% of the fleet's vessel visits and also reduce their onboard auxiliary engine power generation by 50%. The specified percentages increased to 70% in 2017 and will increase to 80% in 2020. Alternatively, vessel operators may choose to use an approved equivalent emissions reduction option such as the Marine Exhaust Treatment System – 1 (Clean Air Engineering-Maritime, Inc.) or Advanced Marine Emissions Control System (Advanced Cleanup Technologies, Inc.) to achieve an equivalent emissions reduction (CARB, 2007).

### CARB Regulation Related to Ocean Going Ship Onboard Incineration

CARB adopted this regulation in 2005 and amended it in 2006. As of November 2007, the regulation has prohibited all OGVs greater than 300 registered gross tons from conducting on-board incineration within 3 nm of the California coast.

### CARB Mobile Cargo-Handling Equipment at Ports and Intermodal Rail Yards

In December 2005, CARB approved the Regulation for Mobile CHE at Ports and Intermodal Rail Yards (CCR Title 13, Section 2479) designed to use BACT to reduce diesel PM 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. The effects of this regulation are accounted for in CARB's CHE Inventory Model emission factors used in this study (CARB, 2011a). In October 2012, the Office of Administrative Law approved amendments to the CARB regulation to provide additional flexibility for CHE owners/operators in an effort to reduce compliance costs while continuing to reduce emissions (CARB, 2012).

### CARB Emission Standards, Test Procedures, for Large Spark Ignition Engine Forklifts and Other Industrial Equipment

Since 2007, CARB has promulgated more stringent emissions standards for hydrocarbon and oxides of nitrogen combined ($HC + NO_x$) emissions and test procedures. The engine emission standards and test procedures were implemented in two phases. The first phase was implemented for engines built between January 2007 and December 2009. The second more stringent phase was implemented for engines built starting in January 2010. The regulation was amended in 2010 establishing fleet average emissions requirements for existing engines. A 2016 amendment requires operators of in-use fleets to report, label large spark ignition equipment, and continue existing record keeping requirements that were previously set to expire on June 30, 2016.

### CARB California Drayage Truck Regulation

CARB adopted the drayage truck regulation in December 2007 to modernize the class 8 drayage truck fleet (trucks with GVWR greater than 33,000 pounds) in use at California's ports. Emergency vehicles and yard trucks are exempted from this regulation. The regulatory objective is to be achieved in two phases:

- By December 31, 2009, pre-1994 model year engines were to be retired or replaced with 1994 and newer model year engines. In addition, all drayage trucks with 1994 to 2003 model year engines were required to achieve an 85% PM emission reduction through the use of a CARB-approved Level 3 VDEC.
- By December 31, 2013, all trucks operating at California ports were required to comply with the 2007 and newer on-road heavy-duty engine standards.
- Starting January 1, 2023, all trucks operating at California ports will be required to have 2010 or newer model year engines.

In December 2010, CARB amended the regulation to include Class 7 drayage trucks with GVWR between 26,000 and 33,001 pounds. The amended regulation required the acceleration of filter replacements to January 1, 2012 for Class 7 trucks in the SCAB and required that Class 7 trucks statewide operate with 2007 or newer emission standard engines by January 1, 2014. CARB furthermore expanded the definition of drayage trucks to include dray-offs, those non-compliant trucks that may not directly come to the ports to pick up/drop off cargo but that engage in moving cargo destined to or originating from port facilities and to/from near-port facilities or rail yards.

As discussed in this section, above, CARB's ability to implement its California Drayage Truck Regulation may be affected by passage of SB-1.

### CARB On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation—Truck and Bus Regulation

In December 2011, CARB amended the 2008 Statewide Truck and Bus Regulation to modernize in-use heavy-duty vehicles operating throughout the state. Under this regulation, existing heavy-duty trucks are required to be replaced with trucks meeting the latest $NO_x$ and PM BACT or retrofitted to meet these levels.

Trucks with GVWR less than 26,000 (most construction trucks) are required to replace engines with 2010 or newer engines, or equivalent, by January 2023. Trucks with GVWR greater than 26,000 (most drayage trucks) must meet PM BACT and upgrade to a 2010 or newer model year emissions equivalent engine pursuant to the compliance schedule set forth by the rule. By January 1, 2023, all model year 2007 class 8 drayage trucks are required to meet $NO_x$ and PM BACT (i.e., EPA 2010 and newer standards) (CARB, 2011b).

### CARB Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft

In November 2007, CARB adopted a regulation to reduce DPM and $NO_x$ emissions from new and in-use commercial harbor craft. Under CARB's definition, commercial harbor craft include tug boats, tow boats, ferries, excursion vessels, work boats, crew boats, and fishing vessels. The regulation implemented stringent emission limits on harbor craft auxiliary and propulsion engines. In 2010, CARB amended the regulation to add specific in-use requirements for barges, dredges, and crew/supply vessels.

The regulation requires that all in-use, newly purchased, or replacement engines meet EPA's most stringent emission standards per a compliance schedule set forth by CARB. For harbor craft with home ports in the SCAQMD, the compliance schedule is accelerated by two years, as compared to statewide requirements. The compliance schedule as listed in the 2007 regulation for in-use engine replacement was supposed to begin in 2009, but was not enforced until August 2012, after EPA approved CARB's regulation.

#### CARB Statewide Portable Equipment Registration Program

The Portable Equipment Registration Program (PERP) establishes a uniform program to regulate portable engines and portable engine-driven equipment units (CARB, 2011c). Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts. Equipment subject to the PERP must meet weighted fleet average PM emission requirements, per CARB's phased-in compliance schedule, based on engine size. The PERP generally would apply to construction-related dredging and barge equipment.

## 3.1.3.4 Local Rules and Regulations

SCAQMD develops Rules and Regulations to regulate sources of air pollution in the SCAB. SCAQMD's regulatory authority applies primarily to stationary sources. The emission sources associated with the Revised Project are mobile sources and as such are, for the most part, not subject to the SCAQMD rules that apply to stationary sources, such as Regulation XIII (New Source Review), Rule 1401 (New Source Review of Toxic Air Contaminants), or Rule 431.2 (Sulfur Content of Liquid Fuels). However, SCAQMD's Rule 402 would apply to the Revised Project as discussed 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.

## 3.1.3.5 LAHD Emission Reduction Programs

LAHD has developed several programs designed to reduce pollution from mobile sources associated with Port operations. Programs pertinent to the Revised Project are listed below.

### San Pedro Bay Ports Clean Air Action Plan

The Ports of Los Angeles and Long Beach, with the participation and cooperation of EPA, CARB, and SCAQMD staff, developed the San Pedro Bay Ports CAAP, a planning and policy document that sets goals and implementation strategies to reduce air emissions and health risks associated with port operations while allowing port development to continue (SPBP, 2006). In addition, the CAAP sought the reduction of criteria pollutant emissions to the levels that ensure port-related sources decrease their "fair share" of regional emissions to enable the SCAB to attain state and federal ambient air quality standards. Each individual CAAP measure is a proposed strategy for achieving these emissions reductions goals. The ports approved the first CAAP in November 2006.

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;
- Technology advancement programs to reduce emissions; and
- Public participation processes with environmental organizations and the business communities.

The CAAP focuses primarily on reducing DPM, as well as $NO_x$ and $SO_x$. DPM reduction 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, MOUs, voluntary action, grants, or incentive programs.

The 2010 CAAP Update adopted in November 2010 includes updated and new emission control measures as proposed strategies that support the goals expressed as the Source-Specific Performance Standards and the Project-Specific Standards. In addition, the 2010 CAAP Update includes the 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 (SPBP, 2010).

The goals set forth as the San Pedro Bay Standards, as part of the 2010 CAAP update, 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 is measured against these Bay-wide Standards, which consist of the following reductions as compared to 2005 emissions levels:

- Health Risk Reduction Standard: 85% reduction in DPM by 2020
- Emission Reduction Standards:

  By 2014, reduce emissions by 72% for DPM, 22% for $NO_x$, and 93% for $SO_x$

  By 2023, reduce emissions by 77% for DPM, 59% for $NO_x$, and 92% for $SO_x$

The Project-Specific Standard remains as adopted in the original CAAP in 2006, requiring that new projects fall below the 10 in 1,000,000 excess residential cancer risk threshold, as determined by health risk assessments 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 LAHD Board of Harbor Commissioners retains 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 goals set forth as the Source-Specific Performance Standards of the CAAP address a variety of port-related emission sources—ships, trucks, trains, CHE, and harbor craft—and outline specific strategies to reduce emissions from each source category. The Source-Specific Performance Standards have been updated as detailed in Section 2 of the CAAP Update, and the applicable emission control measures (as detailed in Section 4 of the CAAP Update) for the Revised Project are discussed below.

Although LAHD has adopted a general policy that its leases will be compliant with the CAAP, the Board of Harbor Commissioners 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 Board of Harbor Commissioners as to any specific future action. Each individual CAAP measure is a proposed strategy for achieving necessary emission reductions. The Board of Harbor Commissioners uses its discretion in its 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.

### CAAP Measure—SPBP-OGV1, Vessel Speed Reduction Program

Under this voluntary program, 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. Reduction in speed demands less power from the main engine, which in turn reduces fuel usage and emissions. 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. The CAAP adopted the VSRP as control measure OGV-1 and expanded the program out to 40 nm from the Point Fermin Lighthouse in 2008.

### CAAP Measure—SPBP-OGV2, Reduction of At-Berth OGV Emissions

This measure requires the use of shore power to reduce hoteling emissions at all container and cruise terminals by 2014. This measure also requires demonstration and application of alternative emissions reduction technologies for ships that are not viable candidates for shore power, to be facilitated through the Technology Advancement Program (TAP).

### CAAP Measure—SPBP-OGV5 and 6, Cleaner OGV Engines and OGV Engine Emissions Reduction Technology Improvements and Environmental Ship Index Program

Measure OGV5 seeks to maximize the early introduction and preferential deployment of vessels to the San Pedro Bay Ports with cleaner/newer engines meeting the new IMO $NO_x$ standard for ECAs. Measure OGV6 focuses on reducing DPM and $NO_x$ from the legacy fleet through identification and deployment of effective emission reduction technologies.

In order to advance the goals of OGV5 and 6, LAHD approved the voluntary Environmental Ship Index (ESI) Program in May 2012. The ESI Program is an international clean ship indexing program developed through the International Association of Ports and Harbors' World Ports Climate Initiative. Operators registered under this program earn an ESI score for their vessels by using cleaner technology and practices that reduce emissions beyond the regulatory requirements set by IMO. The ESI Program rewards vessel operators for reducing $NO_x$, $SO_x$, and GHG emissions in advance of regulatory requirements. The ESI Program also rewards vessel operators for bringing their newest and cleanest vessels to the Port and demonstrating technologies on board their vessels. This program became effective in July 2012.

### CAAP Measure—SPBP-HC1, Performance Standards for Harbor Craft

The measure calls for repowering all harbor craft home-based in the San Pedro Bay to Tier 3 within five years after Tier 3 engines become available. The measure also requires the use of shore power. In addition, LAHD plans to accelerate harbor craft emission reductions through emerging technologies, such as hybrid tugs, more efficient engine configurations, and alternative fuels, through incentives or voluntary measures.

### CAAP Measure—SPBP-CHE1, Performance Standards for CHE

This measure calls for 2007 through 2014 phased-in CHE emission reductions beyond CARB's CHE regulation, at the time of terminal lease renewal. As of 2007, CHE purchases were required to meet the cleanest available $NO_x$ available at the time of purchase or install cleanest available VDEC. In addition, by the end of 2010, yard tractors were required to meet, at a minimum, the EPA 2007 on-road or Tier 4 engine standards. By the end of 2012, pre-2007 on-road or pre-Tier 4 off-road toppicks, forklifts, reach stackers, rubber tired gantry cranes (RTGs), and straddle carriers were required to meet EPA 2007 on-road engine standards or Tier 4 off-road engine standards. Finally, by the end of 2014, all CHE with engines greater than 750 hp were required to meet, at a minimum, the EPA Tier 4 off-road engine standards. Starting in 2007 and until equipment is replaced with Tier 4, all CHE with engines greater than 750 hp were required to be equipped with the cleanest CARB VDEC.

### CAAP Measure—SPBP-RL1, Pacific Harbor Line Rail Switch Engine Modernization

This measure implements the switch locomotive engine modernization and emission reduction requirements included in the operating agreements between the ports and the Pacific Harbor Line (PHL). In 2010, PHL entered into a third amendment to their operating agreements, which facilitated the upgrade of their Tier 2 switcher locomotive fleet to meet Tier 3-plus standards. By the end of 2011, PHL upgraded all of its Tier 2 switcher locomotives to meet Tier 3-plus standards.

### CAAP Measure—SPBP-RL2, Class 1 Line-Haul and Switcher Fleet Modernization

This measure is designed to identify emission reductions associated with the CARB Class 1 railroads MOU and the 2008 EPA locomotive engine standards. The goal of this measure is for all Class 1 locomotives entering the ports to meet emissions equivalent to Tier 3 locomotive standards by 2023.

### CAAP Measure—SPBP-HDV1, Performance Standards for On-Road Heavy-Duty Vehicles; Clean Trucks Program

The Port Clean Trucks Program (CTP) is a central element of the CAAP. The CTP established 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 to 1993 trucks were banned from the Port in addition to 1994 to 2003 trucks that had not been retrofitted. As of January 1, 2012, all trucks that did not meet the 2007 Federal Clean Truck Emissions Standards were banned from the Port. Following full implementation in 2012, Port truck emissions were reduced by more than 90% for DPM, PM and $SO_x$, and by 79% for $NO_x$ (LAHD, 2012). The analysis assumes full compliance with the CTP.

### 2017 CAAP Update

The latest CAAP Update, adopted in November 2017, re-affirms the Ports' commitment to the goals and standards of previous CAAP versions, but also introduces new goals, standards, and programs. The 2017 CAAP Update incorporates two new emission reduction targets:

- Reduce greenhouse gases (GHG) from port-related sources to 40% below 1990 levels by 2030
- Reduce GHGs from port-related sources to 80% below 1990 levels by 2050.

The 2017 update retains the reduction targets for emissions of diesel particulates, nitrogen oxides, and sulfure oxides set in the 2010 update. It also retains the health risk reduction goals set by the 2010 update, re-affirms the Ports' commitment to those goals, and further commits the Ports to working with regulators and stakeholders toward further reductions in emissions and health risks.

In addition, the 2017 CAAP Update incorporates the recent commitment by the mayors of Los Angeles and Long Beach to move towards zero emissions at the Ports, including setting goals of zero-emissions cargo-handling equipment by 2030 and zero-emissions drayage trucks by 3035. Accordingly, the updated CAAP includes provisions for new investments in clean technology, expanded use of at-beth emission reduction technologies, and a zero-emissions drayage truck pilot program. The updated CAAP also includes a CAAP Implementation Stakeholder Advisory Group to advise the Ports on details of CAAP implementation and ongoing operational efficiency and energy conservation programs; a commitment to the nationwide Green Ports Collaborative; and a commitment to a joint effort to secure funding for necessary equipment purchases and infrastructure development.

## 3.1.4 Impacts and Mitigation Measures

This section presents a discussion of the potential air quality impacts associated with operation of the Revised Project. Since the Revised Project consists of the continued operation of the CS Container Terminal under modified mitigation measures, this Recirculated Draft SEIR does not include discussion of construction-related impacts (AQ-1 and AQ-2). Furthermore, for the reasons discussed in Section 3.1.4.3, two of the operational impact issues (AQ-5 and AQ-6) are also not considered in this Recirculated Draft SEIR. Accordingly, the air quality impacts associated with operational emissions considered in this document are:

- Impact AQ-3: Would the Revised Project result in operational emissions that exceed the SCAQMD peak day emission thresholds of significance?
- Impact AQ-4: Would operation of the Revised Project result in offsite ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance?
- Impact AQ-7: Would the Revised Project expose receptors to significant levels of toxic air contaminants?
- Impact AQ-8: Would the Revised Project conflict with or obstruct implementation of an applicable AQMP?

Mitigation measures included as part of the Revised Project are described below. The 2008 EIR/EIS concluded that emissions from construction and operation of the CS

Container Terminal would exceed SCAQMD thresholds of significance and proposed a suite of mitigation measures to reduce construction-related emissions (MM AQ-1 through MM AQ-8) and operational emissions (MM AQ-9 through MM AQ-24). The measures associated with construction have all been completed or will be completed after the construction of the remaining two buildings. Accordingly, construction-related emissions are not considered in this Recirculated Draft SEIR. Of the 52 mitigation measures adopted in the 2008 EIS/EIR, 10 mitigation measures and one lease measure (Table 2-1 in Section 2) have either not yet been fully implemented or not yet been implemented for various reasons, including availability of technology, terminal and vessel operational changes, and financial considerations. Of these 10 mitigation measures, six (MM AQ-9, MM AQ-10, MM AQ-15, MM AQ-17 [which includes MM AQ-16], MM AQ-20, and MM AQ-23) affect air quality. Furthermore, MM AQ-23 has been eliminated as a mitigation measure, as discussed in Section 2.1.5.

### 3.1.4.1 Methodology

This section summarizes the methodologies used to assess air quality impacts under CEQA. The following types of impacts were analyzed:

- Air pollutant emissions of CO, VOC, $NO_x$, $SO_x$, $PM_{10}$, and $PM_{2.5}$ within the SCAB were estimated for operation of the Revised Project. To determine their significance, the Revised Project emissions minus the 2008 Actual Baseline (see Section 3.1.4.2) emissions were compared to Significance Criterion AQ-3 identified in Section 3.1.4.4. The criteria pollutant emission calculations and assumptions are presented in Appendix B1.
- Dispersion modeling of CO, $NO_x$, $SO_x$, $PM_{10}$, and $PM_{2.5}$ emissions was performed to estimate maximum offsite air pollutant concentrations from emission sources attributed to the Revised Project. The predicted ambient concentrations associated with operation of the Revised Project were compared to Significance Criterion AQ-4. A summary of the dispersion modeling methodology is presented in this section, while the complete dispersion modeling report is presented in Appendix B2.
- An HRA of toxic air contaminant (TAC) emissions associated with operation of the Revised Project was conducted in accordance with the methodology in OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2015). Maximum predicted health risk values in the communities adjacent to the project site were compared to Significance Criterion AQ-7. The HRA analyzed Revised Project emissions and human exposure to the emissions during 25-, 30-, and 70-year periods, each starting in 2009. The HRA includes an evaluation of three different types of health effects: individual cancer risk, chronic non-cancer hazard index, and acute non-cancer hazard index.
- To better apprise the public and decision makers of the Revised Project's environmental impacts, the predicted cancer risk for the Revised Project is compared to both:
    a) **A static Baseline** (the 2008 Actual Baseline in this case). The static Baseline cancer risk uses 2008 activity levels and emission factors based on actual compliance of 2008 EIR/EIS Mitigations at the time, and assumes these remain constant or "static" over 25-, 30-, and 70-year exposure periods.

b) **A floating Future Baseline**. The floating Future Baseline cancer risk also uses 2008 activity levels, but uses emission factors, projected over the 25-, 30-, and 70-year exposure periods, that incorporate the effects of existing air quality regulations. The floating Future Baseline does not include effects of mitigation measures from either the Revised Project or FEIR Mitigated Scenario; rather, it includes solely the future effects of existing air quality regulations. The floating Future Baseline is only used for cancer risk impact evaluation and not used against other impacts related to ambient concentrations or emissions.

The static Baseline represents higher emissions than the floating Future Baseline because the floating Future Baseline emission factors for port-related equipment generally decline in response to future implementation of existing air quality regulations and assumptions regarding equipment fleet turnover. The complete HRA Report is presented in Appendix B3.

- LAHD has developed a methodology for assessing mortality and morbidity in CEQA documents based on the health effects associated with changes in $PM_{2.5}$ concentrations. Because mortality and morbidity studies represent major inputs used by CARB and EPA to set CAAQS and NAAQS, project-level mortality and morbidity is presented in LAHD CEQA documents as a further elaboration of local $PM_{2.5}$ impacts, which are already addressed in Impact AQ-4. Per LAHD policy, mortality and morbidity are quantified if dispersion modeling of ambient air quality concentrations during project operation identifies a significant impact for 24-hour $PM_{2.5}$. Mortality and morbidity effects are calculated for the population living inside the 2.5 $\mu g/m^3$ project increment isopleth identified during the dispersion modeling.
- The emission estimates, dispersion modeling, and health risk estimates presented in this document were calculated using the latest available data, assumptions, and emission factors at the time this document was prepared. The numerical results presented in the tables of this report were rounded, often to the nearest whole number, for presentation purposes. As a result, the sum of tabular data in the tables could differ slightly from the reported totals. For example, if emissions from Source A equal 1.2 pounds per day (lbs/day) and emissions from Source B equal 1.4 lbs/day, the total emissions from both sources would be 2.6 lbs/day. However, in a table, the emissions would be rounded to the nearest lbs/day, such that Source A would be reported as 1 lbs/day, Source B would be reported as 1 lbs/day, and the total emissions from both sources would be reported as 3 lbs/day. Although the rounded numbers create an apparent discrepancy in the table, the underlying addition is accurate.

## Methodology for Determining Emissions

Operational emission sources include container ships, tugboats, on-road trucks, linehaul trains, switchers, and CHE. Some of these sources would use diesel fuel and would generate emissions of diesel exhaust, other sources would use other fuel types including LNG, CNG, LPG, and marine fuels. All of these sources would generate exhaust emissions in the form of CO, VOC, $NO_x$, $SO_x$, $PM_{10}$, and $PM_{2.5}$. In addition, when ships are using AMP, indirect emissions would be created by regional power plants burning fossil fuels to generate the electricity consumed by the hoteling ships. Worker commute trips would generate primarily gasoline vehicle exhaust and paved road dust emissions.

Emissions were evaluated for the 2008 Actual Baseline , and study years of 2012, 2014, 2018, 2023, 2030, 2036 and 2045.

Information regarding the activity and characteristics of Revised Project operational emission sources was obtained primarily from LAHD staff, WBCT staff, the traffic study conducted as part of this Recirculated Draft SEIR (Section 3.3, Ground Transportation), and Port Emissions Inventories (LAHD, 2018). Activity and utilization assumptions used to estimate peak daily operational emissions for comparison to SCAQMD emission thresholds represent upper-bound estimates of activity levels at the terminal, would occur infrequently, and, therefore, represent a conservative set of assumptions.

The general methodology for calculating emissions for the various emission sources during Revised Project operations is presented below. A more detailed discussion of the methodology and presentation of activity, emission factor and other input data is presented in Appendix B-1. Because the Revised Project is within the SCAB, the analysis scope is also limited to the SCAB and to the thresholds established by SCAQMD for that jurisdiction. The SCAQMD thresholds are discussed in Section 3.1.4.4. The operational emission calculations are presented in Appendix B-1. Those mitigation measures from the 2008 EIS/EIR that were implemented, including low-sulfur fuel for ocean-going vessels, diesel particulate filters for yard locomotives, and restrictions on truck idling, have been accounted for in the analysis as part of the baseline, past and future operations. Emissions reductions associated with the slide valve mitigation measure have not been quantified.

#### *Container Ships*

Container ship emissions were derived primarily from vessel call data, and with emission factors and key assumptions from the Port Emission Inventories (LAHD, 2018). The number of vessel visits by vessel size (TEU), time spent in transit, maneuvering and hoteling, usage of AMP, and vessel characteristics include installed main engine power, auxiliary engine power, load factors and speed were obtained from terminal call data for past years (2008-2014). In the 2008 Actual Baseline, activity parameters represent actual vessel calls that occurred in 2008.

Container vessels are tracked from the edge of the SCAB over-water boundary to the berth, and movements include transit to the berth or to an anchorage point, maneuvering at berth, and hoteling at the berth or hoteling at anchorage. Characteristics of vessel engines, including installed main and auxiliary engine power, emissions factors for main and auxiliary engines, engine load during each mode of travel, time in each of mode of travel, and fuel sulfur content were derived from the Port Emission Inventories. Vessel compliance with AMP and the VSRP were based on vessel call data for past years 2008 through 2018. For the 2008 Actual Baseline, emissions were adjusted to show actual levels of compliance with the AMP requirements of 2008 EIS/EIR mitigation measure MM AQ-9 and VSRP requirements of 2008 EIS/EIR mitigation measure MM AQ-10. Peak daily emissions reflect the peak 24-hour period of activity, and thus emissions, considering all actual vessel calls in 2008.

Future year (2018-2045) container vessel activity was obtained from the BERTHA model (AECOM, 2016), including the number of vessel visits annually and in a peak day, the vessel size distribution in future years, and the installed power and load of vessel engines. In general the number of vessel visits was grown according to the forecasted growth in cargo throughput as presented in Chapter 2, with the same modes of activity (transit, maneuvering, hoteling, anchorage) occurring in the future as in the baseline and past years. Future year emissions incorporated the Port's revised fleet forecast for turnover of vessels to those with Tier I, II and III engines (POLA, 2015b) which affects $NO_x$ emissions only. For the Revised Project, future year emissions were evaluated with application of proposed mitigation measures from this Recirculated Draft SEIR as described in Chapter 2, and for the FEIR Mitigated Scenario emissions were evaluated with application of all mitigation measures required by the 2008 EIS/EIR.

#### *Tug Boats*

During terminal operations, tugboats are used to assist container ships while maneuvering and docking inside Port breakwater. Two tugboats were assumed for each arrival/departure assist of a container ship. Tugboat transit time was assumed to equal the average of container ship transit times within the harbor, multiplied by 1.3 to account for tug movement to/from base. Tugboat main and auxiliary engine sizes and load factors were obtained from the Port Emissions Inventories. Tugboat emission factors were derived based on EPA standards for marine compression-ignition engines. The applicable engine tiers were determined based on EPA requirements for new engines, average age and size of tugboats operating in the Port, and CARB harbor craft compliance schedule. CARB requirements for fuel sulfur content were also applied.

#### *Cargo-Handling Equipment (CHE)*

CHE includes yard tractors, rubber-tired gantry cranes (RTGs), top handlers, forklifts, off-road trucks (refueling trucks) and sweepers. The equipment at the terminal includes a mix of diesel powered equipment and LPG-powered equipment (primarily the LPG yard tractors and some LPG forklifts). The marine terminal cranes used to lift containers on and off container ships are electric and, therefore, would have no direct emissions. Yard tractors and top handlers would operate at both the CS terminal and the CS portion of the WBICTF. Equipment inventory details and annual hours of operation was provided by WBCT and the Port Inventories (for each “past” analysis year) for each type of CHE. Emission factors for CHE were obtained from the CARB CHE inventory model, or directly from CARB certification data for certain equipment types (yard tractors) and combined with the activity data to develop emissions. The 2008 Actual Baseline includes actual compliance levels with 2008 EIS/EIR mitigation measures MM AQ-15, MM AQ-16, and MM AQ-17. The Actual Baseline was based on WBCT equipment lists from the annual Port Inventories for 2008 which reflected the compliance level to 2008 EIR/EIS mitigation at the time. Past conditions scenarios for 2012 and 2014 were also based on actual equipment and reflected the compliance level to 2008 EIR/EIS mitigation at the time.

CHE activity in future analysis years was derived based on projected terminal throughput. WBCT supplied a detailed list of CHE equipment operating at the terminal in 2017. Because this included recent purchases and modernized equipment that was installed between 2014 and 2017, the 2017 equipment list was used as the basis for developing future year 2018-2045 CHE emissions. The useful life of each equipment type was tracked and when the useful life was reached the unit was assumed to be replaced with a new unit of the same size. All equipment emissions were adjusted to comply with CARB regulations as described in Section 3.1.3.3. For the Revised Project, future year CHE equipment was modified from the 2017 equipment list in accordance with the revised MM AQ-15, and MM AQ-17 language in this Recirculated Draft SEIR, and to account for future growth based on projected terminal throughput. For the FEIR Mitigated Scenario, the future year emissions were also modified to assume full compliance with all mitigation measures required in the 2008 EIS/EIR.

### *On-Road Trucks*

Emissions from on-road, heavy-duty diesel trucks hauling containers during Revised Project operations were calculated using emission factors generated by the CARB EMFAC2017 on-road mobile source emission factor model. The port-wide drayage truck fleet mix for each past analysis year, including the baseline, was obtained from Port Inventories for the year in question (2008, 2012, 2014), reflecting the regulations at the time. For example, the 2014 year fleet mix reflects the Port's Clean Truck Program which banned all trucks that did not meet 2007 and newer on-road heavy duty truck standards by January 1, 2012. Trucks fueled with liquefied natural gas (LNG) comprise a small fraction of the fleet in past years, with 2012 being the first year for which there were any information available. Because LNG-fueled heavy heavy duty trucks emission rates are not available in any of the CARB-approved models, they were assumed to have the same criteria pollutant emission factors as diesel trucks with a benefit for DPM emissions. DPM emissions, a key contributor to cancer risk impacts, were assumed to be only 1.5% of $PM_{10}$ exhaust emissions since these trucks are dual-fueled and use only a small percentage of diesel fuel. $PM_{10}$ and $PM_{2.5}$ emissions from paved road dust were calculated and added to the EMFAC2017 emissions from truck exhaust, tire wear, and brake wear. Road dust emission factors for on-terminal driving, off-terminal local streets, and freeways were derived from Section 13.2 of EPA's AP-42 compilation of emission factors.

Truck activity on-site included idling at the in-gate, out-gate and on-terminal idling, as well as on-terminal driving. Truck activity off-site included truck travel along roadway links as determined through the transportation modelling (see Section 3.3). In the FEIR Mitigated Scenario, truck emissions were modified to reflect assumed compliance with all mitigation measures from the 2008 EIS/EIR, which consisted of an increase percentage of LNG-fueled trucks in the drayage truck fleet, and therefore assumes reductions in DPM emissions.

In the Revised Project future years, predicted truck emissions were based on fleet forecasts of trucks considering only the effects of the CTP and CARB regulations because no feasible truck mitigation measures were identified to replace MM AQ-20.

### *Rail*

The CS Terminal generates train trips to and from the on-dock rail yard (WBICTF) as well as near- and off-dock rail yards. Containers arriving and departing via a near- or off-dock rail yard are transported between the terminal and rail yard by drayage trucks. Emissions associated with hauling containers by rail include diesel exhaust from PHL locomotives performing switching activities at the on-dock rail yard, Class I switch locomotives performing switching activities at the near- and off-dock rail yards, and line-haul locomotive emissions used during transport within the SCAB and idling at the rail yards.

Emission factors for line haul locomotives were derived from EPA emission factors. For the 2008 Actual Baseline these factors were adjusted to reflect compliance with the CARB 1998 MOU. For all future year scenarios the EPA emission factors obtained through CARB's Vision model were used. The emission factors for PHL switch locomotives at the on-dock rail yard were based on PHL's switch engine fleet and fleet turnover assumptions for future analysis years. The active PHL switcher locomotive fleet in 2014, the year from which turnover was estimated, consisted of a combination of Tier 3-plus and genset locomotives, and were assumed to be converted to Tier 4 locomotives in future years on a 30-year or 15-year repower schedule, respectively. Line haul and switcher engine power and load factors were derived from the Port Emission Inventories. Line haul and switcher activity, both within the on-dock railyard and for off-site travel were obtained from LAHD staff, WBCT, and from the Port's TrainBuilder model.

#### *Other Considerations*

Appendix B1 contains details of the emissions calculations, including those for sources such as electricity-related emissions from AMP power consumption and worker vehicle commutes.

In general, the past years activity data were obtained from LAHD staff, WBCT, and the Port Emission Inventories (LAHD, 2018). Future year emissions were forecasted as described above, and using a variety of models that forecast activity and emissions factors for various source categories. Future activity was primarily based on the projected TEU throughput at the terminal on an annual basis. Peak daily emissions were derived either directly from models (e.g. for container vessels), or from peaking factors that represent the peak daily throughput relative to average daily throughput. Peak daily emissions were used to derive peak hourly and 8-hour emissions as needed to evaluate various pollutant concentration thresholds.

### Dispersion Modeling Methodology

The dispersion modeling methodology was based on U.S. EPA and SCAQMD modeling guidance (EPA, 2017; SCAQMD, 2018). The EPA dispersion model AERMOD, version 18081, was used to predict maximum ambient pollutant concentrations at or beyond the project site boundary. The following presents a brief summary of the dispersion modeling methodology and assumptions; the complete dispersion modeling report is included in Appendix B2.

- The analysis modeled peak 1-hour and annual $NO_x$ emissions, peak 1-hour and peak daily 24-hour $SO_x$ emissions, peak 1-hour and 8-hour CO emissions, peak 24-hour and annual $PM_{10}$ emissions, and peak 24-hour $PM_{2.5}$ emissions.
- To capture temporal trends in predicted impacts, concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ were modeled for each analysis year (2012, 2014, 2018, 2023, 2030, 2036 and 2045). Because CO and $SO_2$ are unlikely to exceed the ambient air quality standards in any analysis year, emissions used for modeling these two pollutants were a composite of the maximum emissions from each emission source over all analysis years. Thus, single worst-case scenarios were modeled for CO and $SO_2$ whereas individual analysis years were modeled for $NO_2$, $PM_{2.5}$ and $PM_{10}$.
- Valid receptors included all locations along and outside the Revised Project footprint boundary, excluding over-water non-marina receptors, boundary receptors bordering water, and off-site receptors located within modeled roadways and rail lines.
- Significance concentration thresholds for $PM_{10}$ and $PM_{2.5}$ are incremental thresholds. Therefore, impacts were determined by subtracting Baseline modeled concentrations from the Revised Project's modeled concentrations (i.e., Revised Project minus Baseline) at each receptor. Significance was determined by comparing the valid receptor with the greatest increment to the thresholds.
- Significance concentration thresholds for $NO_2$, $SO_2$, and CO are absolute thresholds based on the ambient air quality standards. Therefore, the change in modeled Revised Project concentrations relative to existing conditions (i.e., the

modeled 2008 Actual Baseline) was determined at each receptor, and the valid receptor with the highest change in concentration was added to the ambient background concentration to yield a total concentration. Significance was determined by comparing the total concentration (Revised Project increment plus background) with the threshold.

- Ambient background concentrations were obtained from the Port's Wilmington Community Station. This air monitoring station is part of the Port's site-specific monitoring network, and therefore captures the contributions to ambient air pollutant levels from the Port including the existing China Shipping Terminal. The three most recent years of monitoring data, 2015-2017, were used to determine the background concentrations for the modeled analysis years 2018 through 2045. For analysis years 2012 and 2014, the three years of monitoring data leading up to and including the analysis year were used to determine the background concentrations. Therefore, 2010-2012 monitoring data were used for analysis year 2012, and 2012-2014 monitoring data were used for analysis year 2014.

## Health Risk Assessment Methodology

To better apprise the public and decision makers of the Revised Project's environmental impacts, the predicted cancer risk for the Revised Project was compared to both a static Baseline and a floating Future Baseline. The static Baseline cancer risk used 2008 activity levels and 2008 emission factors based on actual compliance of 2008 EIR/EIS Mitigations at the time, and assumed these remain constant or "static" over 25-, 30-, and 70-year exposure periods. The floating Future Baseline cancer risk also used 2008 activity levels, but used emission factors, projected over 25-, 30-, and 70-year exposure periods, that incorporate the future effects of existing air quality regulations. The static Baseline represents higher emissions than the floating Future Baseline because the floating Future Baseline emission factors for port-related equipment generally decline over time in response to future implementation of existing air quality regulations and assumptions regarding equipment fleet turnover. The complete HRA Report is presented in Appendix B3.

LAHD has developed a methodology for assessing mortality and morbidity in CEQA documents based on the health effects associated with changes in $PM_{2.5}$ concentrations. Because mortality and morbidity studies represent major inputs used by CARB and EPA to set CAAQS and NAAQS, project-level mortality and morbidity is presented in LAHD CEQA documents as a further elaboration of local $PM_{2.5}$ impacts, which are already addressed in Impact AQ-4. Per LAHD policy, mortality and morbidity are quantified if dispersion modeling of ambient air quality concentrations during project operation identifies a significant impact for 24-hour $PM_{2.5}$. Mortality and morbidity effects are calculated for the population living inside the 2.5 µg/m3 project increment isopleth identified during the dispersion modeling.

The EPA dispersion model AERMOD, version 18081, was used to predict ambient pollutant concentrations at or beyond the project site boundary. The Hotspots Analysis and Reporting Program HARP, version 18159 (CARB, 2018), was then used to perform health risk calculations based on output from AERMOD, using assumptions and procedures described in OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2015) and SCAQMD's Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (SCAQMD, 2016).

The HRA evaluated four different types of health effects: individual cancer risk, population cancer burden, chronic noncancer hazard index, and acute noncancer hazard index.

- Individual cancer risk is the additional chance for a person to contract cancer after long-term exposure to Revised Project emissions. The exposure durations assumed in this HRA are 30 years for residential and sensitive receptors, and 25 years for occupational receptors.
- Population cancer burden is an estimate of the expected number of additional cancer cases in the population exposed to Revised Project-generated TAC emissions. It is the product of individual lifetime incremental cancer risk multiplied by the population exposed to that level of incremental risk, calculated at the census block level and summed over all modeled census blocks. For purposes of calculating the cancer burden, a residential lifetime exposure period of 70 years was assumed (OEHHA, 2015). In accordance with SCAQMD guidance (SCAQMD, 2016), cancer burden was calculated in this analysis for all census blocks with an individual lifetime residential cancer risk increment exceeding one in one million ($1 \times 10^{-6}$).
- The chronic hazard index is a ratio of the annual average concentrations of TACs in the air to established reference exposure levels. A chronic hazard index below 1.0 indicates that adverse noncancer health effects from long-term exposure are not expected. Similarly, the acute hazard index is a ratio of the maximum 1-hour average concentrations of TACs in the air to established reference exposure levels. An acute hazard index below 1.0 indicates that adverse noncancer health effects from short-term exposure are not expected.

The main sources of TACs from Revised Project operations would be DPM emissions from container ships, tugboats, cargo handling equipment, locomotives, and trucks. For cancer risk or the chronic hazard index, CARB considers DPM as representative of the total health effects associated with the combustion of diesel fuel. TAC emissions from non-diesel sources (such as alternative fuel engines) and diesel non-internal combustion sources (such as ship auxiliary boilers) also were evaluated in the HRA, although their impacts were minor in comparison to DPM.

To estimate the Revised Project's individual cancer risk impacts for residential and sensitive receptors, TAC emissions were projected for each year over a 30-year period, 2009 to 2038. To estimate occupational cancer risk impacts, TAC emissions were projected each year over a 25-year period, 2009 to 2033. To estimate individual lifetime cancer risk impacts for the calculation of population cancer burden, TAC emissions were projected each year over a 70-year period, 2009 to 2078. The population cancer burden analysis assumes exposure beyond the lease termination date for the terminal in 2045, and therefore is a conservative estimate of the Revised Project's impacts.

The year-by-year Revised Project emission projections for the various exposure periods were interpolated between the emission estimates for 2008, 2012, 2014, 2018, 2023, 2030, 2036, and 2045. Emissions after 2045 were assumed to remain constant at 2045 levels.

To determine significance, this HRA evaluated the incremental change in health effects associated with the Revised Project relative to the 2008 Actual Baseline. Cancer risks and population cancer burden were also evaluated relative to the floating Future Baseline. The resulting incremental health effects values were compared to the significance thresholds for health risk described in Section 3.1.4.3.

## Particulates: Morbidity and Mortality

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

The Revised Project would emit respirable particulates during operation. This analysis addresses potential health effects caused by respirable particulate emissions and discusses existing standards and thresholds developed by regulatory agencies to address health impacts.

### *Health Effects of PM Emissions*

Epidemiological studies substantiate the correlation between the inhalation of ambient PM and increased mortality and morbidity (CARB, 2010a). In 2006, CARB conducted a study to assess the potential health effects associated with exposure to air pollutants arising from ports and goods movement in the state (CARB 2006a; CARB 2006b). CARB's assessment evaluated numerous studies and research efforts, and focused on PM and ozone, as they represent a large portion of known risk associated with exposure to outdoor air pollution. CARB's analysis of various studies allowed large-scale quantification of the health effects associated with emission sources. CARB's assessment quantified premature deaths and increased cases of disease linked to exposure to PM and ozone from ports and goods movement. Table 3.1-4 presents the statewide PM and ozone health effects identified by CARB (CARB, 2006a).

**Table 3.1-4: Annual 2005 Statewide PM and Ozone Health Effects Associated with Ports and Goods Movement in California[a]**

| Health Outcome | Cases Per Year | Uncertainty Range (Cases per Year) [b] |
|---|---|---|
| Premature Death | 2,400 | 720 to 4,100 |
| Hospital Admissions (respiratory causes) | 2,000 | 1,200 to 2,800 |
| Hospital Admissions (cardiovascular causes) | 830 | 530 to 1,300 |
| Asthma and Other Lower Respiratory Symptoms | 62,000 | 24,000 to 99,000 |
| Acute Bronchitis | 5,100 | -1,200 to 11,000 |
| Work Loss Days | 360,000 | 310,000 to 420,000 |
| Minor Restricted Activity Days | 3,900,000 | 2,200,000 to 5,800,000 |
| School Absence Days | 1,100,000 | 460,000 to 1,800,000 |

Source:
CARB, 2006b.
Notes:
[a] Does not include the contributions from particle sulfate formed from $SO_X$ emissions, which is being addressed with several ongoing emissions, measurement, and modeling studies.
[b] Range reflects uncertainty in health concentration-response functions, but not in emissions or exposure estimates. A negative value as a lower bound of the uncertainty range is not meant to imply that exposure to pollutants is beneficial; rather, it is a reflection of the adequacy of the data used to develop these uncertainty range estimates.

In addition, although epidemiologic studies are numerous, few toxicology studies have investigated the responses of human subjects specifically exposed to DPM, and the available epidemiologic studies have not measured the DPM content of the outdoor pollution mix. CARB has made quantitative estimates of the public health impacts of

DPM based on the assumption that DPM is as toxic as the general ambient PM mixture. CARB's study concluded that there are significant uncertainties involved in quantitatively estimating the health effects of exposure to outdoor air pollution. Uncertain elements include emission and population exposure estimates, concentration-response functions, baseline rates of mortality and morbidity that are entered into concentration response functions, and occurrence of additional not-quantified adverse health effects (CARB, 2010a). Numerous new ongoing and proposed studies will likely increase scientific knowledge and provide better estimates of DPM health effects.

It should be noted that PM in ambient air is a complex mixture that varies in size and chemical composition, as well as in space and time. Different types of particles may cause different effects with different time courses, and perhaps only in susceptible individuals. The interaction between PM and gaseous co-pollutants adds additional complexity because in ambient air pollution, a number of pollutants tend to co-occur and have strong interrelationships with each other (e.g., PM, $SO_2$, $NO_2$, CO, ozone) (CARB, 2006a; CARB, 2006b).

Nevertheless, various studies have been published over the past 10 years that substantiate the correlation between the inhalation of ambient PM and increased cases of premature death from heart and/or lung diseases (Pope et al., 1995; Pope et al., 2002; Jerrett et al., 2005; Krewski et al., 2001; Krewski et al., 2009). Studies such as these and studies that have followed since serve as the fundamental basis for PM air quality standards promulgated by SCAQMD, CARB, EPA, and the World Health Organization.

#### *Quantifying Morbidity and Mortality*

LAHD has developed a methodology for assessing morbidity and mortality in CEQA documents, which generally follows the approach used by CARB to estimate statewide health impacts from ports and goods movement in California (CARB, 2006b), incorporating the methodology for mortality published by CARB (CARB, 2010a). In the 2006 analysis, CARB focused on PM and ozone because these are the criteria pollutants for which sufficient evidence of mortality and morbidity effects exists. Modeling changes in ozone concentrations usually require information on emissions from all sources within a region (for example, the SCAB) and is therefore not considered appropriate for project-level analyses. Therefore, the methodology for project-level studies conducted for Port CEQA documents focuses on the health effects associated with changes in PM concentrations. Focusing on PM is also consistent with CARB studies of mortality and morbidity impacts from California ports (CARB, 2006a, CARB, 2006b, and CARB, 2010a).

The SCAQMD's localized significance threshold for a 24-hour $PM_{2.5}$ concentration is 2.5 $\mu g/m^3$ for operational impacts (SCAQMD, 2011b). This value is only 7% of the 24-hour NAAQS and 21% of the annual CAAQS (there is no 24-hour CAAQS for $PM_{2.5}$). This value is based on CARB guidance and epidemiological studies showing significant toxicity (resulting in mortality and morbidity) related to exposure to fine particles. Because mortality and morbidity studies represent major inputs used by CARB and EPA to set CAAQS and NAAQS, project-level mortality and morbidity are presented in LAHD CEQA documents as a further elaboration of local PM impacts that are already addressed. Therefore, mortality and morbidity are quantified only if a $PM_{2.5}$ concentration significance finding is identified as part of the air quality impact analysis. More specifically, mortality and morbidity are quantified if dispersion modeling of ambient air quality concentrations during Revised Project operation (Impact AQ-4) identifies a significant impact for 24-hour $PM_{2.5}$. The zone of influence is the 2.5 µg/$m^3$ isopleth identified during the dispersion modeling.

### 3.1.4.2 Baseline

The baseline used for assessing the air quality and related impacts of the Revised Project in this Recirculated Draft SEIR is the "2008 Actual Baseline", which is identical to a "2008 Mitigated Baseline" (that is, a 2008 baseline which assumes implementation of mitigation measures from the 2008 EIR/EIS) since the conditions during the 2008 Baseline were found to be in compliance with the 2008 EIR/EIS mitigations being evaluated in this document (see Table 3.1-6). Therefore, there is no difference between a 2008 Mitigated Baseline and the 2008 Actual Baseline used in this Recirculated Draft SEIR. This Recirculated Draft SEIR uses the 2008 Actual Baseline in determining the significance of incremental changes to the mitigated impacts anticipated in the 2008 EIS/EIR, due to changes to the project (i.e. proposed modifications to 2008 EIS/EIR Mitigation measures under the Revised Project) and changed circumstances/new information (i.e. incremental increase in terminal throughput as shown in Table 2-3, due to a revised assessment of terminal capacity).

Rules and regulations effective by December 31, 2007 are considered in the 2008 Actual Baseline for the source categories listed. The methodology used to quantify baseline emissions is presented in Section 3.1.4.1, Methodology. The 2008 Actual Baseline includes the following emission sources: container ships, tugboats, trucks, locomotives, cargo handling equipment (CHE), and employee vehicles. More detail on the methodology including the annual and peak day source category activity information is presented in Appendix B1.

In addition, in assessing cancer risk impacts under Impact AQ-7, this Recirculated Draft SEIR employs not only the 2008 Actual ("static") Baseline, but also a secondary analysis that compares the Revised Project to a "floating" Future Baseline.

- The static Baseline uses 2008 activity levels and 2008 emission factors based on actual compliance of 2008 EIR/EIS Mitigations at the time, and assumes these conditions remain constant or "static" over 25-, 30-, and 70-year exposure periods.
- The floating Future Baseline assumes actual 2008 terminal operations and throughput levels, but also incorporates the anticipated effects of reduced emissions in future analysis years (2012, 2014, 2018, 2023, 2030, 2036, and 2045) resulting from air quality regulations as they existed at the time of this analysis. The floating Future Baseline does not assume implementation of any 2008 EIS/EIR Mitigation measures that are proposed for modification under the Revised Project except to the extent that they duplicate existing regulations. This secondary analysis provides a conservative exposure scenario for the cancer risk analysis because it results in a lower baseline and higher Revised Project increment than comparison to the static 2008 Actual Baseline conditions. Therefore, comparison to both the static 2008 Baseline and the floating Future Baseline will better apprise the public and decision makers of the Revised Project's environmental impacts.

The use of both the static Baseline and floating Future Baseline for cancer risk helps to resolve the complication of evaluating the terminal during a fixed point in time (2008 Actual baseline conditions) for a health impact that is based on decades-long exposure periods. This complication does not exist for the chronic and acute hazard indices because they are based on modeled TAC concentrations of one year and one hour, respectively, both of which fit within the 2008 baseline period. Therefore, the floating Future Baseline was used only for cancer risk and population cancer burden. Other impacts such as AQ-4 and AQ-7, concerning operational emissions and concentrations related impacts, respectively, use the 2008 Actual Baseline.

In the floating Future Baseline, emission rates were linearly interpolated between the analysis years (2008, 2012, 2014, 2023, 2030, 2036, and 2045), and were held constant after the analysis surpassed the extent of existing regulations. Emissions determined for the floating Future Baseline 25-, 30-, and 70-year exposure periods were used in the floating Future Baseline cancer risk determination. This approach is consistent with the methodology developed by the Port for previous health risk analyses and with the *Neighbors for Smart Rail v. Exposition Metro Line Const. Authority* (2013) 57 Cal.4th 439, regarding CEQA baselines.

Table 3.1-5 summarizes the peak daily emissions within the SCAB associated with operation of the existing terminal during the 2008 baseline year. Peak daily emissions represent reasonable upper-bound estimates of activity levels at the terminal and would occur infrequently. The 2008 Actual Baseline peak daily emissions are compared to future Revised Project peak daily emissions to determine impact significance for the Revised Project. These comparisons are presented in Section 3.1.4.4.

**Table 3.1-5. Peak Daily Baseline Emissions**

| Source Category | Peak Day Emissions (lb/day) | | | | | |
|---|---|---|---|---|---|---|
| | VOC | CO | NOx | $PM_{10}$ | $PM_{2.5}$ | SOx |
| **2008 Actual Baseline** | | | | | | |
| Cargo Handling Equipment | 35 | 829 | 350 | 9 | 8 | 0.3 |
| Harbor Craft | 3 | 11 | 40 | 2 | 2 | 0.0 |
| Worker Vehicles Offsite | 2 | 66 | 6 | 3 | 1 | 0.1 |
| Trucks Offsite Driving | 93 | 365 | 1466 | 57 | 46 | 1.3 |
| Ocean Going Vessels | 62 | 70 | 1138 | 108 | 87 | 1154 |
| Worker Vehicles Onsite Driving | 1.0 | 7.2 | 0.8 | 0.3 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 23 | 63 | 134 | 13 | 6 | 0.1 |
| Rail Offsite Operations | 35 | 117 | 660 | 23 | 21 | 0.5 |
| Rail On Dock Operations | 6 | 20 | 112 | 4 | 4 | 0.1 |
| **Total Emissions** | **259** | **1549** | **3907** | **218** | **174** | **1156** |

Table 3.1.6 demonstrates that the 2008 Actual Baseline conditions were consistent with the mitigation measures from the 2008 FEIR/FEIS.

**Table 3.1-6: 2008 FEIR Mitigation Measures and actual conditions at the China Shipping Terminal**

| FEIR Measure | 2008 FEIR Mitigation Measure for Mitigated Scenario | 2008 Actual Conditions |
|---|---|---|
| **AQ-9: Alternative Maritime Power (AMP)** | **<u>China Shipping ships</u>** calling at Berths 97-109 must use AMP at the following percentages while hoteling in the Port:<br><br>• January 1 to June 30, 2005: 60 percent of total ship calls (ASJ Requirement)<br>• July 1, 2005: 70 percent of total ship calls (ASJ Requirement)<br>• January 1, 2010: 90 percent of ship calls<br>• January 1, 2011, and thereafter: 100 percent of ship calls<br><br>Additionally, by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at a 100 percent compliance rate, with the exception of circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship. | 86 % of CS-only vessel calls are using AMP. Requirement is 70% for 2008. |
| **AQ-10: Vessel Speed Reduction Program** | **All ships** calling at Berths 97-109 shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area in the following implementation schedule:<br><br>• 2009 and thereafter: 100 percent | Measure does not begin until 2009. |
| **AQ-15: Yard Tractors at Berth 97-109 Terminal** | All yard tractors operated at the Berth 97-109 terminal shall run on alternative fuel (LPG) beginning September 30, 2004, until December 31, 2014 (ASJ Requirement).<br><br>Beginning in January 1, 2015, all yard tractors operated at the Berth 97-109 terminal shall be the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM. | All yard tractors are LPG in 2008. |

| FEIR Measure | 2008 FEIR Mitigation Measure for Mitigated Scenario | 2008 Actual Conditions |
|---|---|---|
| **AQ-16: Yard Equipment at Berth 121-131 Rail Yard** | All diesel-powered equipment operated at the Berth 121-131 terminal rail yard that handles containers moving through the Berth 97-109 terminal shall implement the following measures:<br>• Beginning January 1, 2009, all equipment **purchases** shall be either (1) the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM or (2) the cleanest available NOX diesel-fueled engine meeting 0.015 gm/hp-hr for PM. If there are no engines available that meet 0.0150 gm/hp-hr for PM, the new engines shall be the cleanest available (either fuel type) and will have the cleanest VDECS.<br>• By the end of 2012, all equipment less than 750 hp shall meet the USEPA Tier 4 on-road or Tier 4 non-road engine standards.<br>• By the end of 2014, all equipment shall meet USEPA Tier 4 non-road engine standards. | Measure does not start until 2009. |
| **AQ-17: Yard Equipment at Berth 97-109 Terminal** | September 30, 2004: All diesel-powered toppicks and sidepicks operated at the Berth 97-109 terminal shall run on emulsified diesel fuel plus a DOC (ASJ Requirement).<br>January 1, 2009:<br>• All RTGs shall be electric.<br>• All toppicks shall have the cleanest available NOX alternative fueled engines meeting 0.015 gm/hp-hr for PM.<br>• All equipment purchases other than yard tractors, RTGs, and toppicks shall be either (1) the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM or (2) the cleanest available NOX diesel-fueled engine meeting 0.015 gm/hp-hr for PM. If there are no engines available that meet 0.015 gm/hp-hr for PM, the new engines shall be the cleanest available (either fuel type) and will have the cleanest VDEC.<br>By the end of 2012: all terminal | All top-handlers and side-picks have DOCs according to data from POLA inventory (LAHD 2018). Previous year data (2005-2007) shows top-picks usage of emulsified fuel so it was assumed similar operation in 2008. |

| FEIR Measure | 2008 FEIR Mitigation Measure for Mitigated Scenario | 2008 Actual Conditions |
|---|---|---|
| | equipment less than 750 hp other than yard tractors, RTGs, and toppicks shall meet the USEPA Tier 4 on-road or Tier 4 non-road engine standards.<br><br>By the end of 2014: all terminal equipment other than yard tractors, RTGs, and toppicks shall meet USEPA Tier 4 non-road engine standards. | |
| **AQ-20: LNG Trucks** | MM AQ-20: LNG Trucks<br><br>This MM requires that drayage trucks entering the Berth 97-109 terminal be LNG fueled in the following schedule:<br><br>50% in 2012 and 2013;<br><br>70% in 2014 through 2017;<br><br>100% in 2018 and thereafter. | Measure does not begin until 2012. |

### 3.1.4.3 Thresholds of Significance

The following thresholds were used to determine the significance of air quality impacts of the Revised Project. The thresholds were based on the standards established by the City of Los Angeles in the *L.A. CEQA Thresholds Guide* (City of Los Angeles, 2006). The *L.A. CEQA Thresholds Guide* incorporates, by reference, the CEQA Air Quality Handbook and associated significance thresholds developed by the SCAQMD (SCAQMD, 1993; SCAQMD, 2011b).

Because the Revised Project consists of the continued operation of the CS Container Terminal under modified mitigation measures, only CEQA thresholds associated with operational activities are considered in this Draft SEIR, meaning that thresholds AQ-1 and AQ-2, for construction related impacts, are not included in the Draft SEIR. In addition, the NOP concluded that the Revised Project would not create objectionable odors (threshold AQ-6); accordingly, the NOP determined that this issue would not be addressed in the Draft SEIR. Those issues would also not be affected by the modest increase in terminal throughput under the Revised Project, and need not be re-visited for that reason, either. CO hotspots were considered in the 2008 EIS/EIR under AQ-5. However, information presented by SCAQMD in the 2003 AQMP indicates that CO hotpot analysis is unnecessary because hotspots are unlikely to occur. A study of the four most congested intersections in the Los Angeles region found no exceedances of ambient air quality standards for CO, indicating that hotspots did not occur. Since the study intersections for the Revised Project would experience lower traffic volumes than SCAQMD's study intersections, even with increased throughput, a hotspot analysis is not required. Accordingly, instead of eight thresholds this analysis uses four (AQ-3, AQ-4, AQ-7 andAQ-8).

The *L.A. CEQA Thresholds Guide* provides specific significance thresholds for operational air quality impacts that also are based on SCAQMD standards (City of Los Angeles, 2006).

**Criterion AQ-3:** Would the Revised Project result in operational emissions that exceed the SCAQMD peak day emission thresholds of significance in Table 3.1-7?

For determining significance, these thresholds are compared to the net change in Revised Project operational peak daily emissions relative to Baseline peak daily emissions.

**Table 3.1-7: SCAQMD Thresholds for Operational Emissions**

| Air Pollutant | Peak Day Emission Threshold (pounds/day) |
|---|---|
| Volatile organic compounds (VOC) | 55 |
| Carbon monoxide (CO) | 550 |
| Nitrogen oxides ($NO_X$) | 55 |
| Sulfur oxides ($SO_X$) | 150 |
| Particulates ($PM_{10}$) | 150 |
| Particulates ($PM_{2.5}$) | 55 |

**Source:**
SCAQMD, 2015.

**Criterion AQ-4:** Would operation of the Revised Project result in offsite ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance in Table 3.1-8?

These ambient concentration thresholds target those pollutants the SCAQMD has determined are most likely to cause or contribute to an exceedance of the NAAQS or CAAQS. Although the thresholds represent the levels at which the SCAQMD considers the impacts to be significant, the thresholds are not necessarily the same as the NAAQS or CAAQS.

**Criterion AQ-7:** Would the Revised Project expose receptors to significant levels of toxic air contaminants?

The determination of significance for AQ-7 is made as follows:

- Maximum Incremental Cancer Risk is greater than or equal to 10 in 1 million.
- Cancer Burden is greater than 0.5 excess cancer cases in areas where the maximum incremental cancer risk for residential receptors is greater than 1 in one million.
- Noncancer Hazard Index is greater than or equal to 1.0 (project increment).

**Table 3.1-8: SCAQMD Thresholds for Ambient Air Quality Concentrations Associated with Project Operation**

| Air Pollutant[a] | Operation Ambient Concentration Threshold |
|---|---|
| Nitrogen Dioxide ($NO_2$)[b] | |
| 1-hour average (federal)[c] | 0.100 ppm (188 μg/$m^3$) |
| 1-hour average (state) | 0.18 ppm (339 μg/$m^3$) |
| Annual average (federal) | 0.0534 ppm (100 μg/$m^3$) |
| Annual average (state) | 0.030 ppm (57 μg/$m^3$) |
| Sulfur Dioxide ($SO_2$) | |
| 1-hour average (federal)[d] | 0.075 ppm (196 μg/$m^3$) |
| 1-hour average (state) | 0.250 ppm (655 μg/$m^3$) |
| 24-hour average | 0.040 ppm (105 μg/$m^3$) |
| Carbon Monoxide (CO) | |
| 1-hour average | 20 ppm (23,000 μg/$m^3$) |
| 8-hour average | 9.0 ppm (10,000 μg/$m^3$) |
| Particulates ($PM_{10}$ or $PM_{2.5}$)[e] | |
| 24-hour average ($PM_{10}$ and $PM_{2.5}$) | 2.5 μg/$m^3$ |
| Annual average ($PM_{10}$ only) | 1.0 μg/$m^3$ |

Notes:

[a] The $NO_2$, $SO_2$, and CO thresholds are absolute thresholds; the maximum predicted impact from Revised Project operations is added to the background concentration and compared to the threshold.

[b] To evaluate the Revised Project's impacts on ambient $NO_2$ levels, the analysis included the use of both the current SCAQMD $NO_2$ threshold (0.18 ppm) and the newer, more stringent 1-hour federal ambient air quality standard (0.100 ppm). 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.

[c] Federal 1-hour average $NO_2$ concentration is based on the NAAQS because it is more stringent than the SCAQMD thresholds.

[d] To attain the $SO_2$ federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm.

[e] The $PM_{10}$ and $PM_{2.5}$ thresholds are incremental thresholds; the maximum predicted impact from operational activities (without adding the background concentration) is compared to these thresholds.

Sources:

SCAQMD, 2015; EPA, 2013.

**Criterion AQ-8:** Would the Revised Project conflict with or obstruct implementation of an applicable AQMP?

The consistency of the Revised Project with an applicable air quality plan is assessed qualitatively. The Revised Project would be considered consistent with the local AQMP and not interfere with attainment goals if the Project's activities (e.g. cargo throughput, ship berths) are consistent with the projections utilized in the formulation of the AQMP; in other words if the Project's activities do not exceed the assumptions in the latest AQMP.

Other criteria considers whether the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (except as provided for CO in Section 9.4 for relocating CO hot spots). (SCAQMD, 1993)

### 3.1.4.4 Impact Determination

#### Impact AQ-3: Would the Revised Project result in operational emissions that exceed an SCAQMD threshold of significance in Table 3.1-6?

Table 3.1-9 presents peak daily criteria pollutant emissions associated with operation of the Revised Project. Emissions were estimated for seven study years: 2012, 2014, 2018, 2023, 2030, 2036, and 2045. Peak daily emissions represent upper-bound estimates of activity levels at the terminal and as such would occur infrequently. Comparisons to the Baseline emissions are presented to determine significance.

Revised Project source characteristics, activity levels, fuel sulfur content, emission factors, and other parameters assumed in the operational emissions are discussed in detail in Section 3.1.4.1, Methodology and in Appendix B1.

Revised Project operational mitigation measures are described in Section 2.5.1. These mitigation measures would reduce criteria pollutant emissions associated with project operation. Proposed mitigation measures listed below are used in the Revised Project emissions analysis. For purposes of the emissions estimates in this Recirculated Draft SEIR, it was assumed that the effective date of a new lease amendment is 2019, therefore, effects of Revised Project mitigations are included in the calculations starting from 2019 based on the phasing described by each mitigation measure. Table 3.1-9 shows the peak daily criteria pollutant emissions associated with operation of the Revised Project after the application of MM AQ-9, MM AQ-10, MM AQ-15, and MM AQ-17, as those mitigation measures are proposed to be implemented under the Revised Project.

**MM AQ-9:** **Alternative Maritime Power (AMP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, all ships calling at Berths 97-109 must use AMP while hoteling in the Port, with a 95 percent compliance rate. Exceptions may be made if one of the following circumstances or conditions exists:

1. Emergencies
2. An AMP-capable berth is unavailable
3. An AMP-capable ship is not able to plug in
4. The vessel is not AMP-capable.

In the event one of these circumstances or conditions exist, an equivalent alternative at-berth emission control capture system shall be deployed, if feasible, based on availability, scheduling, operational feasibility, and contracting requirements between the provider of the equivalent alternative technology and the terminal operator. The equivalent alternative technology must, at a minimum, meet the emissions reductions that would be achieved from AMP.

**MM AQ-10:** **Vessel Speed Reduction Program (VSRP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall either 1) comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.

**MM AQ-15:** **Yard Tractors.**

1) No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be replaced with alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants.

2) No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be replaced with alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants.

**MM AQ-16:** **CHE at Rail Yard:** This measure is combined with MM AQ-17 below.

**MM AQ-17:** **Cargo-Handling Equipment.** All yard equipment at the terminal, except for yard tractors, shall implement the following requirements:

<u>Forklifts</u>

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2004 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2005 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 5-ton forklifts of model years 2011 or older shall be replaced with zero-emission units.
- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Toppicks</u>

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2006 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2014 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Rubber-Tired Gantry (RTG) Cranes</u>

- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2003 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2004 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By seven years after the effective date of a new lease amendment between the Tenant and the LAHD, four RTG cranes of model years 2005 and older shall be replaced with all-electric units, and one diesel RTG crane of model year 2005 shall be replaced with a diesel-electric hybrid unit with a diesel engine that meets or is lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Sweepers</u>

- Sweeper(s) shall be alternative fuel or the cleanest available by six years after the effective date of a new lease amendment between the Tenant and the LAHD.

<u>Shuttle Buses</u>

- Gasoline shuttle buses shall be zero-emission units by seven years after the effective date of a new lease amendment between the Tenant and the LAHD.

The following lease measures would also potentially reduce future emissions under the Revised Project. The measures were not quantified as CEQA mitigation measures in the analysis because the future technologies and systems that may be implemented have not yet been identified.

**LM AQ-1:** **Cleanest Available Cargo Handling Equipment.** Subject to zero and near-zero emissions feasibility assessments that shall be carried out by LAHD, with input from Tenant as part of the CAAP process, Tenant shall replace cargo handling equipment with the cleanest available equipment anytime new or replacement equipment is purchased, with a first preference for zero-emission equipment, a second preference for near-zero equipment, and then for the cleanest available if zero or near-zero equipment is not feasible, provided that LAHD shall conduct engineering assessments to confirm that such equipment is capable of installation at the terminal.

Starting one year after the effective date of a new lease amendment between the Tenant and the LAHD, tenant shall submit to the Port an equipment inventory and 10-year procurement plan for new cargo-handling equipment, and infrastructure, and will update the procurement plan annually in order to assist with planning for transition of equipment to zero emissions in accordance with the forgoing paragraph.

LAHD will include a summary of zero and near-zero emission equipment operating at the terminal each year as part of mitigation measure tracking.

**LM AQ-2:** **Priority Access for Drayage.** A priority access system shall be implemented at the terminal to provide preferential access to zero- and near-zero-emission trucks.

**LM AQ-3:** **Demonstration of Zero Emissions Equipment.** Tenant shall conduct a one-year zero emission demonstration project with at least 10 units of zero-emission cargo handling equipment. Upon completion, tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero- emission technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030.

1 **Table 3.1-9. Peak Daily Operational Emissions—Revised Project (lbs/day)**

| | Peak Day Emissions (lb/day) | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| **2012 Actual** | | | | | | |
| Cargo Handling Equipment | 113 | 1,781 | 641 | 17 | 16 | 0.6 |
| Harbor Craft | 3 | 16 | 27 | 1 | 1 | 0.0 |
| Worker Vehicles Offsite | 1 | 44 | 4 | 3 | 1 | 0.1 |
| Trucks Offsite Driving | 27 | 90 | 863 | 34 | 19 | 2.0 |
| Ocean Going Vessels | 69 | 125 | 1,006 | 31 | 29 | 155 |
| Worker Vehicles Onsite Driving | 0.1 | 1.7 | 0.1 | 0.3 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 0.8 | 5.4 | 0.6 | 0.3 | 0.1 | 0.0 |
| Rail Offsite Operations | 8 | 29 | 125 | 11 | 2 | 0.1 |
| Rail On Dock Operations | 5 | 22 | 96 | 3 | 3 | 0.1 |
| **Total** | **253** | **2230** | **3310** | **119** | **88** | **158** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2012 Emissions Minus 2008 Actual Baseline | -6 | 680 | -597 | -99 | -87 | -998 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **No** | **Yes** | **No** | **No** | **No** | **No** |
| **2014 Actual** | | | | | | |
| Cargo Handling Equipment | 250 | 3,992 | 1,398 | 18 | 17 | 1.2 |
| Harbor Craft | 5 | 27 | 49 | 2 | 2 | 0.0 |
| Worker Vehicles Offsite | 1 | 35 | 3 | 3 | 1 | 0.1 |
| Trucks Offsite Driving | 45 | 128 | 1,778 | 58 | 24 | 4.5 |
| Ocean Going Vessels | 242 | 334 | 5,029 | 90 | 83 | 156 |
| Worker Vehicles Onsite Driving | 0.6 | 4.6 | 0.5 | 0.3 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 15 | 70 | 277 | 26 | 4 | 0.4 |
| Rail Offsite Operations | 24 | 125 | 553 | 16 | 15 | 0.5 |
| Rail On Dock Operations | 5 | 25 | 105 | 3 | 3 | 0.1 |
| **Total** | **587** | **4740** | **9192** | **216** | **148** | **163** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2014 Emissions Minus 2008 Actual Baseline | 328 | 3191 | 5284 | -2 | -26 | -994 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **Yes** | **Yes** | **Yes** | **No** | **No** | **No** |
| **2018 Revised Project*** | | | | | | |
| Cargo Handling Equipment | 287 | 3,792 | 1,127 | 14 | 14 | 1.0 |
| Harbor Craft | 2 | 47 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 1 | 37 | 3 | 5 | 1 | 0.1 |
| Trucks Offsite Driving | 52 | 162 | 1,745 | 63 | 31 | 4.2 |
| Ocean Going Vessels | 301 | 155 | 4,239 | 49 | 46 | 112 |
| Worker Vehicles Onsite Driving | 0.8 | 7.0 | 0.6 | 0.6 | 0.1 | 0.0 |

| | Peak Day Emissions (lb/day) | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| Trucks Onsite Driving/Idling | 16 | 76 | 275 | 25 | 5 | 0.3 |
| Rail Offsite Operations | 26 | 152 | 679 | 17 | 16 | 0.6 |
| Rail On Dock Operations | 4 | 24 | 98 | 2 | 2 | 0.1 |
| **Total** | **689** | **4451** | **8186** | **177** | **115** | **118** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2018 Emissions Minus 2008 Actual Baseline | 430 | 2902 | 4278 | -40 | -59 | -1038 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **Yes** | **Yes** | **Yes** | **No** | **No** | **No** |
| **2023 Revised Project** | | | | | | |
| Cargo Handling Equipment | 306 | 2,409 | 478 | 11 | 11 | 1.3 |
| Harbor Craft | 2 | 50 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 28 | 2 | 6 | 1 | 0.1 |
| Trucks Offsite Driving | 12 | 55 | 892 | 57 | 21 | 4.7 |
| Ocean Going Vessels | 193 | 340 | 5,623 | 76 | 71 | 165 |
| Worker Vehicles Onsite Driving | 0.6 | 6.8 | 0.5 | 0.7 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 148 | 183 | 30 | 5 | 0.4 |
| Rail Offsite Operations | 28 | 220 | 789 | 18 | 17 | 0.9 |
| Rail On Dock Operations | 4 | 28 | 97 | 2 | 2 | 0.1 |
| **Total** | **557** | **3286** | **8084** | **201** | **127** | **172** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2023 Emissions Minus 2008 Actual Baseline | 298 | 1736 | 4177 | -16 | -47 | -984 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **Yes** | **Yes** | **Yes** | **No** | **No** | **No** |
| **2030 Revised Project** | | | | | | |
| Cargo Handling Equipment | 51 | 654 | 56 | 3 | 3 | 1.4 |
| Harbor Craft | 3 | 53 | 21 | 1 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 23 | 1 | 6 | 2 | 0.1 |
| Trucks Offsite Driving | 8 | 59 | 780 | 62 | 22 | 4.3 |
| Ocean Going Vessels | 372 | 716 | 4,594 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.4 | 5.8 | 0.4 | 0.8 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 207 | 34 | 5 | 0.4 |
| Rail Offsite Operations | 20 | 233 | 581 | 12 | 11 | 0.9 |
| Rail On Dock Operations | 3 | 28 | 69 | 1 | 1 | 0.1 |
| **Total** | **468** | **1937** | **6310** | **234** | **151** | **177** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2030 Emissions Minus 2008 Actual Baseline | 209 | 388 | 2403 | 16 | -23 | -979 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |

| | Peak Day Emissions (lb/day) | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| **Significant?** | **Yes** | **No** | **Yes** | **No** | **No** | **No** |
| **2036 Revised Project** | | | | | | |
| Cargo Handling Equipment | 69 | 687 | 61 | 3 | 3 | 1.4 |
| Harbor Craft | 3 | 56 | 22 | 1 | 1 | 0.1 |
| Worker Vehicles Offsite | 0 | 21 | 1 | 6 | 1 | 0.1 |
| Trucks Offsite Driving | 6 | 60 | 720 | 63 | 22 | 3.7 |
| Ocean Going Vessels | 372 | 716 | 2,992 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.2 | 5.2 | 0.4 | 0.7 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 209 | 34 | 5 | 0.3 |
| Rail Offsite Operations | 13 | 222 | 379 | 7 | 7 | 0.9 |
| Rail On Dock Operations | 2 | 27 | 48 | 1 | 1 | 0.1 |
| **Total** | **477** | **1960** | **4432** | **230** | **146** | **177** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2036 Emissions Minus 2008 Actual Baseline | 218 | 410 | 525 | 12 | -28 | -980 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **Yes** | **No** | **Yes** | **No** | **No** | **No** |
| **2045 Revised Project** | | | | | | |
| Cargo Handling Equipment | 55 | 662 | 57 | 3 | 3 | 1.4 |
| Harbor Craft | 2 | 50 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 21 | 1 | 6 | 2 | 0.1 |
| Trucks Offsite Driving | 6 | 68 | 790 | 61 | 21 | 3.2 |
| Ocean Going Vessels | 372 | 716 | 1,288 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.2 | 4.8 | 0.4 | 0.8 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 209 | 34 | 5 | 0.3 |
| Rail Offsite Operations | 8 | 206 | 209 | 3 | 3 | 0.8 |
| Rail On Dock Operations | 1 | 27 | 31 | 0 | 0 | 0.1 |
| **Total** | **455** | **1920** | **2606** | **224** | **141** | **176** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2045 Emissions Minus 2008 Actual Baseline | 196 | 371 | -1301 | 6 | -34 | -980 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **Significant?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

Note:

*2018 analysis year is based on projected activity and does not qualify as "Actual". However, in this analysis Revised Project mitigations do not begin until 2019, therefore 2018 reflects compliance with 2008 EIR/EIS mitigations at the time.

Rail Offsite Operations considered for the peak day include emissions occurring only within SCAB boundaries

OGV emissions for peak day include operations up to SCAB Overwater Boundary

### Impact Determination

As shown in Table 3.1-9, incremental peak daily emissions of the Revised Project relative to the 2008 Actual Baseline are below the SCAQMD significance thresholds for all pollutants and averaging times in all analysis years except for VOC, CO and NOx. Incremental Peak daily CO emissions exceed the SCAQMD thresholds for analysis years 2012 to 2023 relative to the 2008 Actual Baseline. Incremental peak daily VOC emissions exceed the SCAQMD thresholds for analysis years 2014 to 2045, and NOx thresholds are exceeded for analysis years 2014 to 2036.

### Discussion of Revised Project Emissions Trends

Emissions would vary over the life of the Revised Project due to several factors, such as regulatory requirements, activity levels, source (container ships, tugboats, trucks, locomotives, CHE, and worker vehicles) characteristics, and emission factors. The combination of these factors can result in emissions that do not always decrease or increase consistently over time.

For the Revised Project, terminal activity would increase from 2008 through 2030 and then remain steady through 2045. However, regulatory requirements described in Section 3.1.3 would serve to decrease emission factors from most project sources. In addition, as equipment ages, engine efficiency would decrease and emission factors would increase in comparison to brand-new equipment.

The main drivers of the operational emissions presented for the Revised Project under Impact AQ-3 are the following:

**Terminal throughput:** Terminal throughput would increase from just over 387,000 TEUs during 2008 to just under 1,700,000 TEUs in year 2030 and thereafter (Table 2-3).

**Container ships:** Container ship size would increase and the number of container ship visits would increase in proportion to the TEU throughput forecast for the terminal. $NO_x$ emissions for vessels would decrease as vessels are turned over from lower tiers to Tier III vessels in accordance with the Port's fleet forecast. Vessel emissions would be reduced as a result of MM AQ-10 (VSRP). Vessel emissions at berth would decrease as a result of MM AQ-9 (AMP).

**Tugboats:** Tugboat activity would increase in proportion to the number of containership visits. Tugboat emission factors would decline in compliance with CARB's Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft Operated within California Waters and 24 nm of the California Baseline (CARB, 2010b).

**CHE:** CHE activity would increase in proportion to terminal throughput. CHE emission factors would decline in compliance with CARB's *Mobile CHE at Ports and Intermodal Rail Yards*. (CARB, 2012). Mitigation measures MM AQ-15, MM AQ-17 would further reduce CHE emissions by requiring more rapid turnover to cleaner equipment or electrification of equipment.

**Trucks:** Truck activity would increase as terminal throughput increases. Truck emission factors decrease significantly after 2008 and remain close to 2012 levels because the Port's Clean Truck Program required all drayage trucks to meet 2007 EPA emission standards starting January 2012. The emission factors would increase slightly from 2012 to 2018 as the truck fleet ages. In 2023, $NO_x$ emission factors are predicted to decline below 2012 levels in response to the CARB On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation, which requires that trucks meet EPA 2010 and newer standards.

**Locomotives:** Locomotive activity would increase as terminal throughput increases. Line haul and switch locomotive emission factors would decline as older locomotives reach the end of their useful life and are replaced by newer, cleaner locomotives that meet EPA tiered emission standards, such as the Tier 4 standards that apply to new and remanufactured locomotives starting in 2015.

### Feasibility of Additional Mitigation Measures

No additional feasible mitigation measures were identified that could reduce emissions below those shown in Table 3.1-7. Mitigation measure feasibility for each major source category is discussed below.

- **Container ships:** MM AQ-9 (AMP) and MM AQ-10 (VSRP) represent the maximum feasible mitigation measures for shoreside power and vessel speed reduction, respectively, as described in Section 25.2.1. No additional mitigation measures targeting either main propulsion or auxiliary engines on container ships are feasible. The Port does not have the authority to impose any specific emissions reduction technology on OGVs as they are internationally flagged vessels subject only to IMO regulations. No other feasible operational measures within the Port's authority were identified that could result in reductions in container ship emissions.
- **Tugboats:** No other feasible operational or technology-based mitigation measures were identified that could further reduce tugboat emissions. The 2010 CAAP update measure HC-1 already identifies compliance with the CARB fleet average emissions regulation, which requires turnover of harbor craft engines to higher tier levels following the phase-in schedule of the regulation. Measure HC-1 also identifies the goal of encouraging shoreside power use by harbor craft when at their home port locations. Harbor craft that would assist container ships calling on the CS Terminal are not controlled by either the Port of Los Angeles or the CS Terminal. They are owned and operated by separate, private companies that contract with shipping lines to provide vessel assist. Because neither LAHD nor China Shipping controls the tugboats, it is not feasible to require the use of advanced emissions reduction technology, such as hybrid main propulsion engines. Instead, state and federal regulations must control harbor craft sources.
- **CHE:** As discussed in Section 2.5.2.2, the proposed CHE mitigations under MM AQ-15 (Yard Tractors) and MM AQ-17 (CHE) represent the most stringent measures that could be feasibly applied to the mix of equipment at the Berths 97-109 terminal. For yard tractors, no existing all-electric yard tractors have been demonstrated for operation at port terminals and are commercially available at this time. The proposed mitigation measure already calls for alternative-fueled yard tractors meeting the most stringent emissions standards available at this time, ultra low NOx standard of 0.02 g/bhp-hr (see section 2.5.2.1). For RTG cranes, WBCT has indicated that not all RTGs would be compatible with electrification due to physical limitations and configuration of the CS Terminal, the need to conduct trenching to bring electrical cables to the RTG operating areas, and the physical dimensions of the electric RTG cranes. However, WBCT confirmed that four electric RTGs in the surcharge area at the terminal are feasible because infrastructure in that location has already been installed. Forklifts above 5-tons are not available in all-electric models and therefore it is not feasible to electrify 12-ton and larger forklifts. The replacement schedule for

equipment represents the most rapid feasible deployment of this equipment considering the approval date of the Draft SEIR, the lead time to order and manufacture the number of units required at the Berths 97-109 terminal, and the maximum number of units that can be manufactured annually (WBCT, 2016). However, in order to ensure the cleanest available CHE is implemented in the future and in support of the new CAAP concept encouraging the transition to zero- and near-zero emissions terminal equipment by 2030, new lease measures, LM AQ-1 (Cleanest Available Cargo Handling Equipment) and LM AQ-3 (Demonstration of Zero Emission Equipment), which are described above and in Chapter 2, are recommended to complement MM AQ-15 and MM AQ-17.

- **Trucks:** As discussed in Section 3.1.3.3, above, Health and Safety Code Section 43201, enacted by SB-1 (2017), restricts the ability of CARB and other agencies to mandate the removal and retrofitting of trucks from California's public highways and roads. That restriction, by its terms, "does not apply to voluntary incentive or grant programs, including but not limited to, those that give preferential access to a facility to a particular vehicle or class of vehicles." Nevertheless, Section 43201 may complicate the ability of the LAHD to require retirement, replacement, or retrofitting of drayage trucks in advance of CARB regulation adopted in accordance with SB-1.

  The Port has studied the feasibility of imposing truck mitigation measures beyond those in MM AQ-20 (LAHD, 2017b). The conclusion of this study is that there are industry structural, technology, or financial constraints that do not allow for any other feasible means to require specific truck technologies for drayage trucks that call on the Berths 97-109 terminal. This issue is discussed in greater detail in Section 2.5.2.2.

  Although the 2017 CAAP Update approved in November 2017 (SPBP, 2017) encourages a priority access program at terminals to accelerate the deployment of zero- and near-zero-emission trucks, the concept is still being studied to understand how implementation of such a program would enable drivers with the cleanest trucks to get access to a terminal more quickly, thus allowing them to make more daily moves – called "turns" – and potentially earn more revenue so that drivers and trucking companies could invest in zero- and near-zero-emission trucks. Given there are physical constraints of access roads into marine terminals, the Ports would need to conduct a pilot program to gauge the potential effectiveness and to ensure implementation does not result in even longer waits for other trucks at the gates, resulting in greater emissions overall. Based on the above, no other feasible operational mitigation measures were identified that could reduce drayage emissions.

  Nevertheless, the LAHD is recommending a new lease measure, LM AQ-2 (Priority Access System), described above, that is intended to reduce drayage truck emissions by incentivizing the use of cleaner trucks.

- **Rail:** The CAAP has already identified feasible measures to address switcher and line haul locomotive emissions. CAAP measures RL-1, RL-2 and RL-3 set goals for modernizing switcher and line haul locomotives to the extent feasible. Neither switching locomotives, which are owned and operated by Pacific Harbor Line, or line-haul locomotives, which are owned and operated by the Class I railroads (i.e., BNSF and UP), are under the control of LAHD or China Shipping. As a result, it is not within the authority of LAHD to impose, or China Shipping to require, more advanced locomotive emissions control than is achievable through the CAAP measures, federal regulations, and the CARB MOU (see Section 3.2.1). No other feasible operational or technological measures were identified that could reduce rail emissions at the WBCT on-dock railyard.

### Residual Impacts

As shown in Table 3.1-9, peak day emissions from the Revised Project, which includes the mitigations described above minus the 2008 Actual Baseline emissions, are below the applicable significance thresholds in all cases except for VOC, CO and NOx emissions which exceed the significance thresholds for certain analysis years. In summary, residual impacts of the Revised Project for significance criterion AQ-3 are significant and unavoidable for CO during analysis years 2012-2023, VOC during analysis years 2014-2045 and NOx during analysis years 2014-2036.

### *Comparison of Impacts of FEIR Mitigated Scenarios to 2008 Actual Baseline (informational only)*

As mentioned previously, the FEIR Mitigated Scenario is represented by peak daily operational emissions assuming that all mitigation measures included in the 2008 EIS/EIR had been fully and timely implemented, and further assuming the incremental increase in terminal throughput as shown in Table 2-3 (hereafter referred to as the "FEIR Mitigated Scenario" in Table 3.1-10). These are compared to the 2008 Actual Baseline. Because the FEIR Mitigated Scenario represents conditions with implementation of the mitigation measures from the 2008 EIS/EIR, rather than with implementation of the modified mitiation measures proposed under the Revised Project, comparison of the FEIR Mitigated Scenario to the 2008 Actual Baseline is presented for purposes of information disclosure only; this document does not base any determination of the significance of impacts of the Revised Project under CEQA on this comparison. Therefore the significance determinations for each analysis year of the FEIR Mitigated Scenario are not shown.

The FEIR Mitigated Scenario emissions minus the 2008 Actual Baseline exceed the emissions thresholds for VOC during analysis years 2014-2045, CO during analysis years 2012-2014 and NOx during analysis years 2014-2036. A comparison of Tables 3.1-9 and 3.1-10 shows that the FEIR Mitigated Scenario emissions are slightly lower than those of the Revised Project emissions for all pollutants during analysis years 2012-2023, except CO in 2014. During analysis years 2030-2045 the FEIR Mitigated Scenario emissions start to approach and slightly exceed the Revised Project emissions for all pollutants except CO and SOx .

**Table 3.1-10. Peak Daily Operational Emissions: FEIR Mitigated Scenario (lb/day) (informational only)**

| Peak Day Emissions (lb/day) | | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| **2012 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 103 | 1,766 | 458 | 12 | 12 | 0.5 |
| Harbor Craft | 3 | 16 | 27 | 1 | 1 | 0.0 |
| Worker Vehicles Offsite | 1 | 44 | 4 | 3 | 1 | 0.1 |
| Trucks Offsite Driving | 27 | 90 | 863 | 34 | 19 | 2.0 |
| Ocean Going Vessels | 49 | 78 | 417 | 15 | 14 | 82 |
| Worker Vehicles Onsite Driving | 0.8 | 5.4 | 0.6 | 0.3 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 8 | 29 | 125 | 11 | 2 | 0.1 |
| Rail Offsite Operations | 27 | 117 | 547 | 18 | 17 | 0.5 |
| Rail On Dock Operations | 5 | 22 | 96 | 3 | 3 | 0.1 |
| **Total** | **222** | **2167** | **2538** | **99** | **69** | **86** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2012 Emissions Minus 2008 Actual Baseline | -37 | 617 | -1369 | -119 | -105 | -1071 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **2014 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 245 | 4,055 | 771 | 11 | 11 | 0.9 |
| Harbor Craft | 5 | 27 | 49 | 2 | 2 | 0.0 |
| Worker Vehicles Offsite | 1 | 35 | 3 | 3 | 1 | 0.1 |
| Trucks Offsite Driving | 45 | 128 | 1,778 | 58 | 24 | 4.5 |
| Ocean Going Vessels | 218 | 274 | 4,453 | 77 | 71 | 143 |
| Worker Vehicles Onsite Driving | 0.6 | 4.6 | 0.5 | 0.3 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 15 | 70 | 277 | 26 | 4 | 0.4 |
| Rail Offsite Operations | 24 | 125 | 553 | 16 | 15 | 0.5 |
| Rail On Dock Operations | 5 | 25 | 105 | 3 | 3 | 0.1 |
| **Total** | **558** | **4743** | **7989** | **196** | **130** | **150** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2014 Emissions Minus 2008 Actual Baseline | 299 | 3193 | 4082 | -22 | -44 | -1007 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **2018 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 42 | 270 | 98 | 3 | 3 | 2.1 |
| Harbor Craft | 2 | 47 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 1 | 37 | 3 | 5 | 1 | 0.1 |
| Trucks Offsite Driving | 52 | 162 | 1,745 | 63 | 31 | 4.2 |
| Ocean Going Vessels | 289 | 124 | 3,908 | 42 | 39 | 99 |
| Worker Vehicles Onsite Driving | 0.8 | 7.0 | 0.6 | 0.6 | 0.1 | 0.0 |

| Peak Day Emissions (lb/day) | | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| Trucks Onsite Driving/Idling | 16 | 76 | 275 | 25 | 5 | 0.3 |
| Rail Offsite Operations | 26 | 152 | 679 | 17 | 16 | 0.6 |
| Rail On Dock Operations | 4 | 24 | 98 | 2 | 2 | 0.1 |
| **Total** | **433** | **897** | **6825** | **159** | **97** | **106** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2018 Emissions Minus 2008 Actual Baseline | 174 | -652 | 2918 | -59 | -77 | -1050 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **2023 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 120 | 549 | 155 | 6 | 5 | 1.2 |
| Harbor Craft | 2 | 50 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 28 | 2 | 6 | 1 | 0.1 |
| Trucks Offsite Driving | 12 | 55 | 892 | 57 | 21 | 4.7 |
| Ocean Going Vessels | 193 | 340 | 5,623 | 76 | 71 | 165 |
| Worker Vehicles Onsite Driving | 0.6 | 6.8 | 0.5 | 0.7 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 148 | 183 | 30 | 5 | 0.4 |
| Rail Offsite Operations | 28 | 220 | 789 | 18 | 17 | 0.9 |
| Rail On Dock Operations | 4 | 28 | 97 | 2 | 2 | 0.1 |
| **Total** | **371** | **1425** | **7761** | **196** | **122** | **172** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2023 Emissions Minus 2008 Actual Baseline | 112 | -124 | 3854 | -22 | -52 | -984 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **2030 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 60 | 478 | 121 | 5 | 4 | 1.3 |
| Harbor Craft | 3 | 53 | 21 | 1 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 23 | 1 | 6 | 2 | 0.1 |
| Trucks Offsite Driving | 8 | 59 | 780 | 62 | 22 | 4.3 |
| Ocean Going Vessels | 372 | 716 | 4,594 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.4 | 5.8 | 0.4 | 0.8 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 207 | 34 | 5 | 0.4 |
| Rail Offsite Operations | 20 | 233 | 581 | 12 | 11 | 0.9 |
| Rail On Dock Operations | 3 | 28 | 69 | 1 | 1 | 0.1 |
| **Total** | **477** | **1761** | **6375** | **236** | **152** | **177** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2030 Emissions Minus 2008 Actual Baseline | 218 | 212 | 2468 | 18 | -22 | -979 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |

| Peak Day Emissions (lb/day) | | | | | | |
|---|---|---|---|---|---|---|
| **Source Category** | **VOC** | **CO** | **NOx** | **$PM_{10}$** | **$PM_{2.5}$** | **SOx** |
| **2036 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 122 | 599 | 138 | 6 | 6 | 1.3 |
| Harbor Craft | 3 | 56 | 22 | 1 | 1 | 0.1 |
| Worker Vehicles Offsite | 0 | 21 | 1 | 6 | 1 | 0.1 |
| Trucks Offsite Driving | 6 | 60 | 720 | 63 | 22 | 3.7 |
| Ocean Going Vessels | 372 | 716 | 2,992 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.2 | 5.2 | 0.4 | 0.7 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 209 | 34 | 5 | 0.3 |
| Rail Offsite Operations | 13 | 222 | 379 | 7 | 7 | 0.9 |
| Rail On Dock Operations | 2 | 27 | 48 | 1 | 1 | 0.1 |
| **Total** | **530** | **1872** | **4509** | **232** | **148** | **177** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2036 Emissions Minus 2008 Actual Baseline | 270 | 323 | 602 | 15 | -26 | -980 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |
| **2045 FEIR Mitigated Scenario** | | | | | | |
| Cargo Handling Equipment | 131 | 620 | 141 | 6 | 6 | 1.3 |
| Harbor Craft | 2 | 50 | 20 | 0 | 0 | 0.1 |
| Worker Vehicles Offsite | 0 | 21 | 1 | 6 | 2 | 0.1 |
| Trucks Offsite Driving | 6 | 68 | 790 | 61 | 21 | 3.2 |
| Ocean Going Vessels | 372 | 716 | 1,288 | 115 | 106 | 170 |
| Worker Vehicles Onsite Driving | 0.2 | 4.8 | 0.4 | 0.8 | 0.1 | 0.0 |
| Trucks Onsite Driving/Idling | 11 | 165 | 209 | 34 | 5 | 0.3 |
| Rail Offsite Operations | 8 | 206 | 209 | 3 | 3 | 0.8 |
| Rail On Dock Operations | 1 | 27 | 31 | 0 | 0 | 0.1 |
| **Total** | **532** | **1879** | **2690** | **227** | **144** | **176** |
| 2008 Actual Baseline | 259 | 1,549 | 3,907 | 218 | 174 | 1,156 |
| Total 2045 Emissions Minus 2008 Actual Baseline | 273 | 329 | -1218 | 10 | -31 | -980 |
| Significance Threshold | 55 | 550 | 55 | 150 | 55 | 150 |

Note:

Rail Offsite Operations considered for the peak day include emissions occurring only within SCAB boundaries

OGV emissions for peak day include operations up to SCAB Overwater Boundary

Table 3.1-11 summarizes the emission impacts for each scenario in each analysis year. The absolute difference between Revised Project daily emissions and the FEIR Mitigated Scenario emissions are also shown. By that comparison, Table 3.1-11 shows the incremental emissions that resulted from partial compliance with the 2008 EIR/EIS mitigation measures.

**Table 3.1-11. Summary of Emission Impacts for Revised Project and FEIR Mitigated Scenario (informational only)**

| Pollutant | Year | Peak day emissions minus 2008 Actual Baseline (lbs/day) | | Daily Threshold (lb/day) | Difference between scenarios |
|---|---|---|---|---|---|
| | | Revised Project | FEIR Mitigated | | |
| VOC | 2012 | -6 | -37 | 55 | 31 |
| | 2014 | 328 | 299 | 55 | 29 |
| | 2018 | 430 | 174 | 55 | 256 |
| | 2023 | 298 | 112 | 55 | 187 |
| | 2030 | 209 | 218 | 55 | -9 |
| | 2036 | 218 | 270 | 55 | -53 |
| | 2045 | 196 | 273 | 55 | -76 |
| NOx | 2012 | -597 | -1369 | 55 | 772 |
| | 2014 | 5284 | 4082 | 55 | 1203 |
| | 2018 | 4278 | 2918 | 55 | 1360 |
| | 2023 | 4177 | 3854 | 55 | 323 |
| | 2030 | 2403 | 2468 | 55 | -65 |
| | 2036 | 525 | 602 | 55 | -77 |
| | 2045 | -1301 | -1218 | 55 | -84 |
| CO | 2012 | 680 | 617 | 550 | 63 |
| | 2014 | 3191 | 3193 | 550 | -3 |
| | 2018 | 2902 | -652 | 550 | 3554 |
| | 2023 | 1736 | -124 | 550 | 1860 |
| | 2030 | 388 | 212 | 550 | 176 |
| | 2036 | 410 | 323 | 550 | 88 |
| | 2045 | 371 | 329 | 550 | 42 |
| $PM_{10}$ | 2012 | -99 | -119 | 150 | 20 |
| | 2014 | -2 | -22 | 150 | 20 |
| | 2018 | -40 | -59 | 150 | 19 |
| | 2023 | -16 | -22 | 150 | 5 |
| | 2030 | 16 | 18 | 150 | -2 |
| | 2036 | 12 | 15 | 150 | -3 |
| | 2045 | 6 | 10 | 150 | -3 |
| $PM_{2.5}$ | 2012 | -87 | -105 | 55 | 19 |
| | 2014 | -26 | -44 | 55 | 18 |
| | 2018 | -59 | -77 | 55 | 18 |

| Pollutant | Year | Peak day emissions minus 2008 Actual Baseline (lbs/day) | | Daily Threshold | Difference between |
|---|---|---|---|---|---|
| | 2023 | -47 | -52 | 55 | 5 |
| | 2030 | -23 | -22 | 55 | -1 |
| | 2036 | -28 | -26 | 55 | -3 |
| | 2045 | -34 | -31 | 55 | -3 |
| SOx | 2012 | -998 | -1071 | 150 | 73 |
| | 2014 | -994 | -1007 | 150 | 13 |
| | 2018 | -1038 | -1050 | 150 | 12 |
| | 2023 | -984 | -984 | 150 | 0 |
| | 2030 | -979 | -979 | 150 | 0 |
| | 2036 | -980 | -980 | 150 | 0 |
| | 2045 | -980 | -980 | 150 | 0 |

### Impact AQ-4: Would operation of the Revised Project result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance?

Dispersion modeling of onsite and offsite Revised Project emissions was performed to assess the impact of the Revised Project on local ambient air concentrations for each analysis year (2012, 2014, 2018, 2023, 2030, 2036, and 2045). A summary of the dispersion modeling results is presented here; the complete dispersion modeling report is included in Appendix B2.

For $NO_2$, $SO_2$, and CO, impacts were determined by comparing the absolute Revised Project air quality concentration impacts to the SCAQMD significance thresholds. The absolute Revised Project air quality concentration impacts were calculated by taking the modeled concentrations from the terminal operating as the Revised Project, subtracting the modeled concentrations from the terminal operating under the 2008 Actual Baseline, and adding the observed background concentrations obtained from the Wilmington Community Monitoring Station.

For $PM_{10}$ and $PM_{2.5}$, impacts were determined by comparing incremental impacts to the SCAQMD significance thresholds. Incremental impacts were calculated by taking the modeled concentrations from terminal operations in each analysis year under the Revised Project, and subtracting the modeled concentrations from terminal operations in the 2008 Actual Baseline.

Table 3.1-12 presents the maximum off-site $NO_2$ concentration impacts associated with the Revised Project. Table 3.1-13 presents the maximum off-site $SO_2$ and CO concentration impacts associated with the Revised Project. Table 3.1-14 presents the maximum off-site incremental $PM_{10}$ and $PM_{2.5}$ concentration impacts associated with the Revised Project. $NO_2$, $PM_{10}$, and $PM_{2.5}$ impacts were modeled separately for each analysis year. Because CO and $SO_2$ are unlikely to exceed the ambient air quality standards in any analysis year, emissions used for modeling these two pollutants were a composite of the maximum emissions from each emission source over all analysis years. Thus, single worst-case scenarios were modeled for CO and $SO_2$.

Results in Tables 3.1-12 through 3.1-14 show that impacts of the Revised Project would exceed the significance thresholds for federal 1-hour $NO_2$ in 2014 and 2018, state 1-hour

$NO_2$ in 2014, annual $NO_2$ in 2014 and 2018, 24-hour $PM_{10}$ in 2014 through 2045, and annual $PM_{10}$ in 2014 through 2045. Impacts of $SO_2$, CO, and $PM_{2.5}$ would be below the thresholds in all analysis years.

#### *Impact Determination*

Tables 3.1-12 and 3.1-14 show that impacts of the Revised Project would exceed the significance thresholds for federal 1-hour $NO_2$ in 2014 and 2018, state 1-hour $NO_2$ in 2014, annual $NO_2$ in 2014 and 2018, 24-hour $PM_{10}$ in 2014 through 2045, and annual $PM_{10}$ in 2014 through 2045. Therefore, maximum off-site ambient pollutant concentrations associated with the Revised Project would be significant for $NO_2$ (state and federal 1-hour and annual) and $PM_{10}$ (24-hour and annual).

### Mitigation Measures

As described in section 3.1.4.4, no additional mitigation measures were identified that could further reduce emissions, and hence ambient air quality concentrations.

### Residual Impacts

Since no additional mitigation measures were identified to further reduce ambient air quality concentration impacts, the residual impacts remain significant and unavoidable.

### Comparison of Impacts to the FEIR Mitigated Scenario to 2008 Actual Basline (informational only)

Dispersion modeling was conducted to evaluate ambient air quality concentration impacts that would occur under the FEIR Mitigated Scenario for comparison with the Revised Project concentration impacts presented above. The maximum off-site ambient air quality concentration impacts associated with the FEIR Mitigated Scenario are summarized in Tables 3.1-15 through 3.1-17. Impacts of the FEIR Mitigated Scenario would exceed the significance thresholds for 24-hour and annual $PM_{10}$ in 2014 and 2023 through 2045. Impacts would be below the thresholds for $NO_2$, $SO_2$, CO, and $PM_{2.5}$ in all analysis years. Comparisons of FEIR Mitigated Scenario impacts to SCAQMD thresholds are provided here for informational purposes only.

### Table 3.1-12. Maximum Off-Site Ambient $NO_2$ Concentrations – Revised Project

| Pollutant | Averaging Period | Analysis Year | Background Concentration ($ug/m^3$)[c] | Maximum Modeled Project Concentration Increment ($ug/m^3$)[d,f] | Total Concentration ($ug/m^3$)[a,e] | Significance Threshold ($ug/m^3$) | Significant? |
|---|---|---|---|---|---|---|---|
| $NO_2$[b] | Federal 1-hour | 2012 | 139 | 40.3 | 179 | 188 | No |
| | | 2014 | 127 | 158.9 | **286** | 188 | **Yes** |
| | | 2018 | 123 | 108.7 | **232** | 188 | **Yes** |
| | | 2023 | 123 | 15.6 | 139 | 188 | No |
| | | 2030 | 123 | 11.6 | 135 | 188 | No |
| | | 2036 | 123 | 4.3 | 127 | 188 | No |
| | | 2045 | 123 | < 0 | 123 | 188 | No |
| | State 1-hour | 2012 | 185 | 44.4 | 229 | 339 | No |
| | | 2014 | 173 | 169.6 | **343** | 339 | **Yes** |
| | | 2018 | 164 | 119.2 | 283 | 339 | No |
| | | 2023 | 164 | 19.9 | 184 | 339 | No |
| | | 2030 | 164 | 13.0 | 177 | 339 | No |
| | | 2036 | 164 | 5.1 | 169 | 339 | No |
| | | 2045 | 164 | 1.2 | 165 | 339 | No |
| | Annual | 2012 | 40 | 11.6 | 52 | 57 | No |
| | | 2014 | 34 | 31.7 | **66** | 57 | **Yes** |
| | | 2018 | 32 | 25.2 | **57** | 57 | **Yes** |
| | | 2023 | 32 | 8.7 | 41 | 57 | No |
| | | 2030 | 32 | 1.6 | 34 | 57 | No |
| | | 2036 | 32 | 0.6 | 33 | 57 | No |
| | | 2045 | 32 | 0.7 | 33 | 57 | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] The federal 1-hour $NO_2$ modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour $NO_2$ modeled concentration represents the maximum concentration.
[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[d] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.

1 **Table 3.1-13. Maximum Off-Site Ambient $SO_2$ and CO Concentrations – Revised Project**

| Pollutant | Averaging Period | Background Concentration (ug/m$^3$)[b] | Maximum Modeled Project Concentration Increment (ug/m$^3$)[c,e] | Total Concentration (ug/m$^3$)[a,d] | Significance Threshold (ug/m$^3$) | Significant? |
|---|---|---|---|---|---|---|
| $SO_2$ | Federal 1-hour | 61 | < 0 | 61 | 196 | No |
| | State 1-hour | 137 | < 0 | 137 | 655 | No |
| | 24-hour | 24 | < 0 | 24 | 105 | No |
| CO | 1-hour | 5,740 | 2,216 | 7,956 | 23,000 | No |
| | 8-hour | 3,444 | 1,554 | 4,998 | 10,000 | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[c] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[e] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.

**Table 3.1-14. Maximum Off-Site Ambient $PM_{10}$ and $PM_{2.5}$ Concentration Increments – Revised Project**

| Pollutant | Averaging Period | Analysis Year | Maximum Modeled Project Concentration Increment (ug/m³)[a,b,c,d] | Significance Threshold (ug/m³) | Significant ? |
|---|---|---|---|---|---|
| $PM_{10}$ | 24-hour | 2012 | 1.9 | 2.5 | No |
| | | 2014 | **5.9** | 2.5 | **Yes** |
| | | 2018 | **4.7** | 2.5 | **Yes** |
| | | 2023 | **4.9** | 2.5 | **Yes** |
| | | 2030 | **3.8** | 2.5 | **Yes** |
| | | 2036 | **3.9** | 2.5 | **Yes** |
| | | 2045 | **3.9** | 2.5 | **Yes** |
| | Annual | 2012 | 0.7 | 1.0 | No |
| | | 2014 | **1.9** | 1.0 | **Yes** |
| | | 2018 | **1.5** | 1.0 | **Yes** |
| | | 2023 | **1.7** | 1.0 | **Yes** |
| | | 2030 | **1.4** | 1.0 | **Yes** |
| | | 2036 | **1.4** | 1.0 | **Yes** |
| | | 2045 | **1.4** | 1.0 | **Yes** |
| $PM_{2.5}$ | 24-hour | 2012 | 1.2 | 2.5 | No |
| | | 2014 | 2.2 | 2.5 | No |
| | | 2018 | 1.2 | 2.5 | No |
| | | 2023 | 0.3 | 2.5 | No |
| | | 2030 | < 0 | 2.5 | No |
| | | 2036 | < 0 | 2.5 | No |
| | | 2045 | < 0 | 2.5 | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Baseline.
[c] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.
[d] Because the thresholds for $PM_{10}$ and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

.

**Table 3.1-15. Maximum Off-Site Ambient $NO_2$ Concentrations – FEIR Mitigated Scenario (informational only)**

| Pollutant | Averaging Period | Analysis Year | Background Concentration ($ug/m^3$)[c] | Maximum Modeled Project Concentration Increment ($ug/m^3$)[a,d,f] | Total Concentration ($ug/m^3$)[e] | Significance Threshold ($ug/m^3$) | Significant? |
|---|---|---|---|---|---|---|---|
| $NO_2$[b] | Federal 1-hour | 2012 | 139 | 9.6 | 149 | 188 | No |
| | | 2014 | 127 | 53.5 | 180 | 188 | No |
| | | 2018 | 123 | 9.1 | 132 | 188 | No |
| | | 2023 | 123 | 11.1 | 134 | 188 | No |
| | | 2030 | 123 | 11.6 | 135 | 188 | No |
| | | 2036 | 123 | 4.3 | 127 | 188 | No |
| | | 2045 | 123 | < 0 | 123 | 188 | No |
| | State 1-hour | 2012 | 185 | 16.9 | 202 | 339 | No |
| | | 2014 | 173 | 61.7 | 235 | 339 | No |
| | | 2018 | 164 | 10.8 | 175 | 339 | No |
| | | 2023 | 164 | 14.6 | 179 | 339 | No |
| | | 2030 | 164 | 13.0 | 177 | 339 | No |
| | | 2036 | 164 | 5.1 | 169 | 339 | No |
| | | 2045 | 164 | 1.3 | 165 | 339 | No |
| | Annual | 2012 | 40 | 5.2 | 45 | 57 | No |
| | | 2014 | 34 | 16.7 | 51 | 57 | No |
| | | 2018 | 32 | 6.4 | 38 | 57 | No |
| | | 2023 | 32 | 3.3 | 35 | 57 | No |
| | | 2030 | 32 | 2.8 | 35 | 57 | No |
| | | 2036 | 32 | 1.9 | 34 | 57 | No |
| | | 2045 | 32 | 1.8 | 34 | 57 | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] The federal 1-hour $NO_2$ modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour $NO_2$ modeled concentration represents the maximum concentration.
[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[d] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.

**Table 3.1-16. Maximum Off-Site Ambient $SO_2$ and CO Concentrations – FEIR Mitigated Scenario (informational only)**

| Pollutant | Averaging Period | Background Concentration (ug/m$^3$)[b] | Maximum Modeled Project Concentration Increment (ug/m$^3$)[a,c,e] | Total Concentration (ug/m$^3$)[d] | Significance Threshold (ug/m$^3$) | Significant? |
|---|---|---|---|---|---|---|
| $SO_2$ | Federal 1-hour | 61 | < 0 | 61 | 196 | No |
| | State 1-hour | 137 | < 0 | 137 | 655 | No |
| | 24-hour | 24 | < 0 | 24 | 105 | No |
| CO | 1-hour | 5,740 | 2,245 | 7,985 | 23,000 | No |
| | 8-hour | 3,444 | 1,569 | 5,013 | 10,000 | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[c] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[e] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.

**Table 3.1-17. Maximum Off-Site Ambient $PM_{10}$ and $PM_{2.5}$ Concentration Increments – FEIR Mitigated Scenario (informational only)**

| Pollutant | Averaging Period | Analysis Year | Maximum Modeled Project Concentration Increment (ug/m³)[a,b,c,d] | Significance Threshold (ug/m³) | Significant? |
|---|---|---|---|---|---|
| $PM_{10}$ | 24-hour | 2012 | 0.5 | 2.5 | No |
| | | 2014 | **3.7** | 2.5 | **Yes** |
| | | 2018 | 1.8 | 2.5 | No |
| | | 2023 | **3.6** | 2.5 | **Yes** |
| | | 2030 | **4.2** | 2.5 | **Yes** |
| | | 2036 | **4.6** | 2.5 | **Yes** |
| | | 2045 | **4.7** | 2.5 | **Yes** |
| | Annual | 2012 | 0.3 | 1.0 | No |
| | | 2014 | **1.3** | 1.0 | **Yes** |
| | | 2018 | 0.6 | 1.0 | No |
| | | 2023 | **1.3** | 1.0 | **Yes** |
| | | 2030 | **1.5** | 1.0 | **Yes** |
| | | 2036 | **1.6** | 1.0 | **Yes** |
| | | 2045 | **1.7** | 1.0 | **Yes** |
| $PM_{2.5}$ | 24-hour | 2012 | 0.004 | 2.5 | No |
| | | 2014 | 0.2 | 2.5 | No |
| | | 2018 | < 0 | 2.5 | No |
| | | 2023 | < 0 | 2.5 | No |
| | | 2030 | < 0 | 2.5 | No |
| | | 2036 | < 0 | 2.5 | No |
| | | 2045 | < 0 | 2.5 | No |

[a] Exceedances of the thresholds are indicated in bold.

[b] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.

[c] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.

[d] Because the thresholds for $PM_{10}$ and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

## Impact AQ-7: Would the Revised Project expose receptors to significant levels of TACs?

The Revised Project would emit TACs that could affect public health. An HRA was conducted to address potential public health impacts generated by the Revised Project using the methodology described in Section 3.1.4.1. Results of the HRA are summarized below; impacts are shown relative the static Baseline and, for cancer risk and population cancer burden, the floating Future Baseline. The need for an analysis based on both the static Baseline and the floating Future Baseline is discussed in detail in Section 3.1.4.2, Baseline. Details of the HRA analysis, including TAC emission calculations, dispersion modeling, and risk calculations, are presented in Appendix B-3.

Maximum health impacts associated with the Revised Project relative to the static and future floating Baselines are summarized in Table 3.1-18. The table presents estimates of individual cancer risk, chronic noncancer hazard index, and acute noncancer hazard index at the maximally exposed residential, occupational, and sensitive receptors.

Maximum individual cancer risks for the Revised Project relative to the static Baseline would be less than zero for all receptors, meaning the risks under the Revised Project would be less than the risks under the static Baseline. Maximum individual cancer risks for the Revised Project relative to the floating Future Baseline would exceed the 10 in a million threshold at residential, sensitive, and occupational receptors. Because the future floating baseline represents declining emission factors due to regulations over exposure periods, the incremental risk against the floating future baseline is higher than that calculated against the static baseline which holds 2008 Actual Baseline emission factors constant over time and thus represents larger emissions. The areas over which the residential cancer risks from the Revised Project relative to the floating Future Baseline would exceed 1, 10 and 100 in a million are shown by the isopleth map in Figure 3.1-2. The maximum predicted chronic and acute hazard indices for the Revised Project relative to the Baseline would be below the 1.0 in a million significance thresholds for all receptors.

**Table 3.1-18. Maximum Health Impacts Estimated for the Revised Project Relative to the Baseline**

| Health Impact | Receptor Type | Revised Project Minus Static Baseline[a,b,d] | Revised Project Minus Floating Future Baseline[a,c,d] | Significance Threshold | Significant? |
|---|---|---|---|---|---|
| Individual Cancer Risk | Residential | < 0 | **$25.4 \times 10^{-6}$<br>25.4 in a million** | $10 \times 10^{-6}$<br>10 in a million | **Yes** |
| | Occupational | < 0 | **$25.9 \times 10^{-6}$<br>25.9 in a million** | | **Yes** |
| | Sensitive | < 0 | **$21.4 \times 10^{-6}$<br>21.4 in a million** | | **Yes** |
| Chronic Hazard Index | Residential | 0.03 | n/a | 1.0 | No |
| | Occupational | 0.23 | n/a | | No |
| | Sensitive | 0.11 | n/a | | No |
| Acute Hazard Index | Residential | 0.19 | n/a | 1.0 | No |
| | Occupational | 0.47 | n/a | | No |
| | Sensitive | 0.30 | n/a | | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] A value less than zero means that the Project health value would be less than the Baseline health value at every modeled receptor.
[c] Health risk increments relative to the floating Future Baseline are applicable only to cancer risk and cancer burden because cancer risk has a uniquely long exposure period (30 years for residential and sensitive exposure, 25 years for occupational exposure, and 70 years for population cancer burden).
[d] Each positive result shown in the table for cancer risk, chronic hazard index, and acute hazard index represents the modeled receptor location with the maximum increment. The increments at all other modelled receptors would be less than the values in the table.

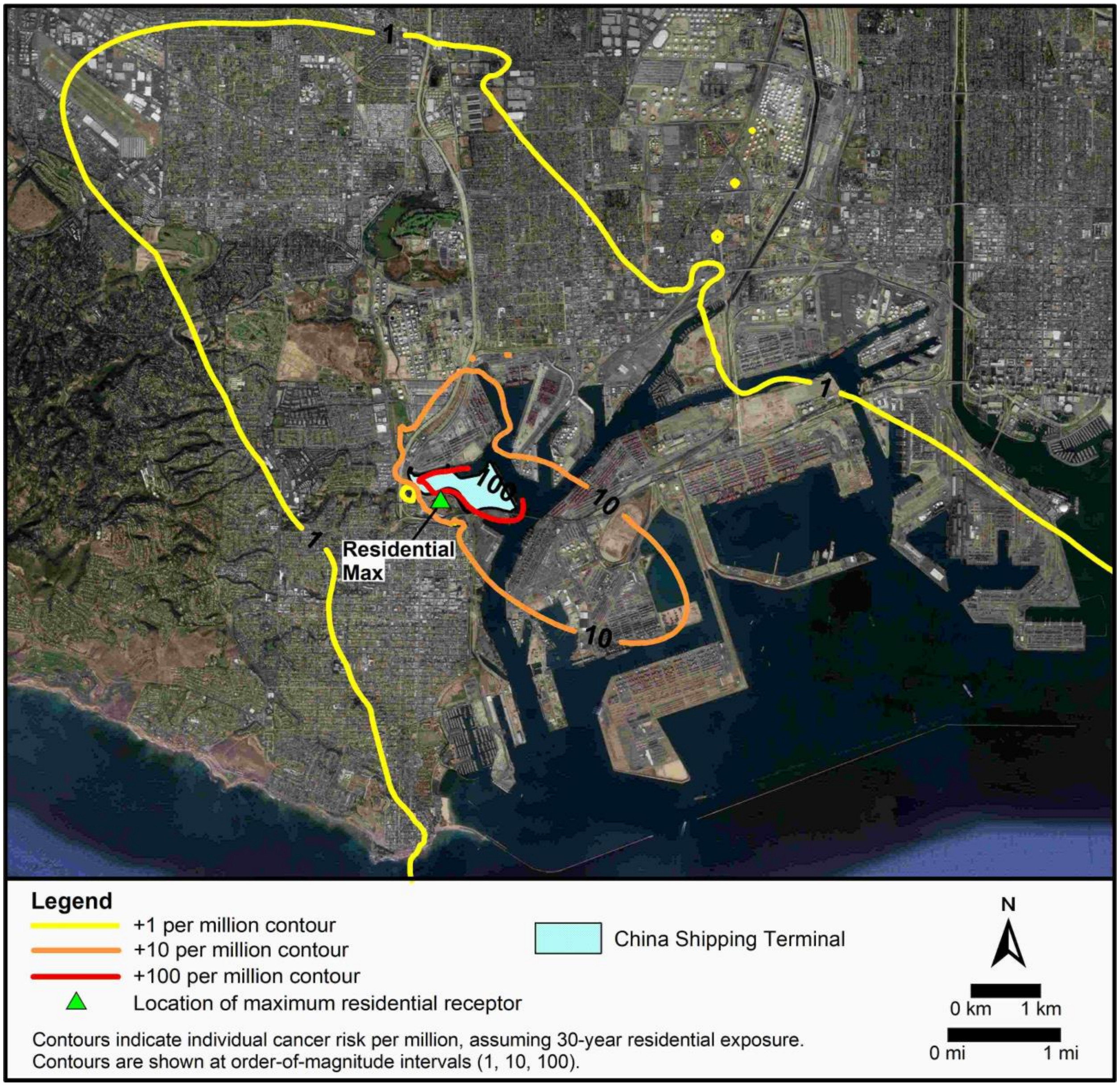
### Cancer Burden

Table 3.1-19 shows that the population cancer burden associated with the Revised Project relative to both the static Baseline and the floating Future Baseline would be less than the significance threshold.

**Table 3.1-19. Cancer Burden Impacts of the Revised Project**

| Health Impact | Revised Project Minus Static Baseline | Revised Project Minus Floating Future Baseline | Significance Threshold | Significant? |
|---|---|---|---|---|
| Cancer Burden | 0 | 0.45 | 0.5 | No |

**Figure 3.1-2: Residential Cancer Risk Associated with the Revised Project Minus Floating Future Baseline**




### *Impact Determination*

Table 3.1-18 shows that the maximum incremental individual cancer risk associated with the Revised Project relative to the future Floating Baseline would be greater than 10 in a million at residential, sensitive, and occupational receptors. The maximum cancer risk at a residential receptor is predicted to be 25.4 in a million, and would occur on Knoll Hill. Therefore, maximum incremental health impacts from the Revised Project for Individual Cancer Risk would be significant.

### Mitigation Measures

As described in section 3.1.4.4, no additional mitigation measures were identified that could further reduce TAC emissions, and hence health risk impacts.

### Residual Impacts

Since no additional mitigation measures were identified to further reduce TAC emissions and resulting health risks, the residual impacts would remain significant and unavoidable.

### Comparison of Impacts to FEIR Mitigated Scenario to 2008 Static and Floating Future Baselines (informational only)

Using the same methods as described above, an HRA was conducted to evaluate health risks which would occur under the FEIR Mitigated Scenario for comparison with the Revised Project health risk impacts presented above. Tables 3.1-20 and 3.1-21 present results for the FEIR Mitigated Scenario which can be compared with results for the Revised Project shown in Tables 3.1-18 and 3.1-19. Maximum individual cancer risks would be lower for the FEIR Mitigated Project as compared to the Revised Project. Maximum incremental individual cancer risks would be less than 10 in a million for the FEIR Mitigated Project relative to both the static 2008 Baseline and the floating Future Mitigated Baseline. Population cancer burden and chronic and acute hazard indices would also be lower for the FEIR Mitigated Scenario.

**Table 3.1-20. Maximum Health Impacts Estimated for the FEIR Mitigated Scenario Relative to the Baseline (informational only)**

| Health Impact | Receptor Type | FEIR Mitigated Scenario Minus Static Baseline[a,b,d] | FEIR Mitigated Scenario Minus Floating Future Baseline[a,c,d] | Significance Threshold | Significant? |
|---|---|---|---|---|---|
| Individual Cancer Risk | Residential | < 0 | $5.1 \times 10^{-6}$<br>5.1 in a million | $10 \times 10^{-6}$<br>10 in a million | No |
| | Occupational | < 0 | $7.2 \times 10^{-6}$<br>7.2 in a million | | No |
| | Sensitive | < 0 | $3.7 \times 10^{-6}$<br>3.7 in a million | | No |
| Chronic Hazard Index | Residential | 0.02 | n/a | 1.0 | No |
| | Occupational | 0.12 | n/a | | No |
| | Sensitive | 0.06 | n/a | | No |
| Acute Hazard Index | Residential | 0.10 | n/a | 1.0 | No |
| | Occupational | 0.24 | n/a | | No |
| | Sensitive | 0.15 | n/a | | No |

[a] Exceedances of the thresholds are indicated in bold.
[b] A value less than zero means that the Project health value would be less than the Baseline health value at every modeled receptor.
[c] Health risk increments relative to the floating Future Baseline are applicable only to cancer risk and cancer burden because cancer risk has a uniquely long exposure period (30 years for residential and sensitive exposure, 25 years for occupational exposure, and 70 years for population cancer burden).
[d] Each positive result shown in the table for cancer risk, chronic hazard index, and acute hazard index represents the modeled receptor location with the maximum increment. The increments at all other modelled receptors would be less than the values in the table.

**Table 3.1-21. Cancer Burden Impacts of the FEIR Mitigated Scenario (informational only)**

| Health Impacts | FEIR Mitigated Scenario Minus Static Baseline | FEIR Mitigated Scenario Minus Floating Future Baseline | Significance Threshold | Significant? |
|---|---|---|---|---|
| Cancer Burden | 0 | 0.03 | 0.5 | No |

***Additional Analysis for Informational Purposes—Particulates: Morbidity and Mortality***

Because the Revised Project $PM_{2.5}$ concentrations in Impact AQ-4 would not exceed 2.5 $\mu g/m^3$, per the methodology described in Section 3.1.4.1, no morbidity and mortality analysis was conducted.

### Impact AQ-8: Would the Revised Project conflict with or obstruct implementation of an applicable AQMP?

LAHD regularly provides SCAG with its Port-wide cargo forecasts for development of the AQMP. Therefore, the attainment demonstrations included in each AQMP account for the emissions generated by projected future growth at the Port. Because the forecasted throughput of the Revised Project is included in the Port-wide projections provided to SCAG (SCAG, 2018), the Revised Project cargo forecast and related emissions are included in the General Conformity budgets established in the Final 2016 AQMP (SCAQMD, 2017). The Revised Project would be considered consistent with the local AQMP and not interfere with attainment goals given that the Revised Project's activities (e.g. cargo throughput, ship berths) are consistent with the projections utilized in the formulation of the AQMP.

Revised Project operations would produce emissions of non-attainment pollutants primarily in the form of diesel exhaust. The SCAQMD prepared AQMPs in 1997, 2003, 2007, 2012 and 2016. The most recent update (the Final 2016 AQMP) was approved by CARB on March 24, 2017. Each iteration of the AQMP is an update of the previous AQMP. The 2007 and 2012 AQMP propose emission reduction measures that are designed to bring the SCAB into attainment of the state and national ambient air quality standards (SCAQMD, 2007, 2013, 2017).

The SCAQMD also adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. The Final 2016 AQMP, as well as the CARB Mobile Source Strategy, contains key control measures related to ports, which include, among many others, the following:

- Emission Reductions at Commercial Marine Ports
- Tier 4 Vessel Standards for OGVs
- Incentivize Low Emission Efficient Ship Visits
- At-Berth Regulation Amendments
- Emission Reductions at Rail Yards and Internodal Facilities
- More Stringent National Locomotive Emission Standards
- Zero-Emission Off-Road Forklift Regulation Phase 1
- Accelerated Retirement of Older On-Road Heavy-Duty Vehicles

Some of these attainment strategies from the 2016 AQMP would become enforceable regulatory measures. Therefore, compliance with these requirements would ensure that the Revised Project would not conflict with or obstruct implementation of the AQMP.

Furthermore, LAHD, in conjunction with the Port of Long Beach, implements the 2017 CAAP Update, which sets goals and implementation strategies that reduce air emissions and health risks from Port operations. Proposed mitigation measures and lease measures and the operational activities of the Revised Project would also be consistent with the San Pedro Bay Ports 2017 CAAP Update goals, including feasibility demonstration of electric and other zero emission technologies, accelerating the use of the cleanest available technology for a number of sources, reduced OGV at-berth and transiting emissions (VSRP), and improving the efficiency of the terminal's operations. These measures are also consistent with the emission reduction goals of the SCAQMD's 2016 AQMP.

### CEQA Impact Determination

The Revised Project would not conflict with or obstruct implementation of the local AQMP.

#### *Mitigation Measures*

No mitigation is required.

#### *Residual Impacts*

Impacts would be less than significant.

### Summary of Impact Determinations

Table 3.1-22 summarizes the CEQA impact determinations of the Revised Project related to air quality and meteorology.

**Table 3.1-22. Summary of Potential Impacts on Air Quality Associated with the Revised Project**

| Impact | Impact Determination |
|---|---|
| AQ-3: Would the Revised Project result in operational emissions that exceed an SCAQMD threshold of significance? | Revised Project emissions of carbon monoxide (CO) would be significant in analysis years 2012, 2014, 2018, 2023; emissions of nitrogen oxides (NOx) would be significant in analysis years 2014, 2018, 2023, 2030, 2036; and emissions of volatile organic compounds (VOC) would be significant in all analysis years except 2012. Emissions of all other criteria pollutants besides CO, NOx and VOC would be less than significant. |
| AQ-4: Would operation of the Revised Project result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance? | Impacts of the Revised Project would be significant for federal 1-hour $NO_2$ in 2014 and 2018, state 1-hour $NO_2$ in 2014, annual $NO_2$ in 2014 and 2018, 24-hour $PM_{10}$ in 2014 through 2045, and annual $PM_{10}$ in 2014 through 2045. Impacts of $SO_2$, CO, and $PM_{2.5}$ would be less than significant. |
| AQ-7: Would the Revised Project expose receptors to significant levels of TACs? | Cancer risks relative to the floating Future Baseline would be significant for residential, sensitive, and occupational receptor types. Cancer risks relative to the static baseline would be less than significant. Chronic and acute non-cancer health impacts and cancer burden would be less than significant. |
| AQ-8: Would the Revised Project conflict with or obstruct implementation of an applicable AQMP? | Revised Project is consistent with local AQMP. Impacts would be less than significant. |

## 3.1.5 Mitigation Monitoring

The mitigation monitoring program below is applicable to the modified mitigation measures in the Revised Project.

**AQ-3: The Revised Project would result in operational-related emissions that exceed an SCAQMD threshold of significance.**

**AQ-4: The Revised Project operation would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.**

**AQ-7: The Revised Project operation would expose sensitive receptors to significant levels of TACs.**

| | |
|---|---|
| Mitigation Measure | **MM AQ-9. Alternative Maritime Power (AMP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, all ships calling at Berths 97-109 must use AMP while hoteling in the Port, with a 95 percent compliance rate. Exceptions may be made if one of the following circumstances or conditions exists:<br>• Emergencies<br>• An AMP-capable berth is unavailable<br>• An AMP-capable ship is not able to plug in<br>• The vessel is not AMP-capable.<br>In the event one of these circumstances or conditions exist, an equivalent alternative at-berth emission control capture system shall be deployed, if feasible, based on availability, scheduling, operational feasibility, and contracting requirements between the provider of the equivalent alternative technology and the terminal operator. The equivalent alternative technology must, at a minimum, meet the emissions reductions that would be achieved from AMP. |
| Timing | Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter. |
| Methodology | LAHD will include this mitigation measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **MM AQ-10. Vessel Speed Reduction Program (VSRP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall either 1) comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD. |
| Timing | Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter. |
| Methodology | LAHD will include this mitigation measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD. |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **MM AQ-15. Yard Tractors.** 1) No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be replaced with alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants. 2) No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be replaced with alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants. |
| Timing | During operation, as specified in the mitigation measure. |

| | |
|---|---|
| Methodology | LAHD will include this mitigation measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD. |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **MM AQ-17. Cargo-Handling Equipment**. All yard equipment at the terminal, except for yard tractors, shall implement the following requirements:<br>Forklifts<br>○ By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2004 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2005 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 5-ton forklifts of model years 2011 or older shall be replaced with zero-emission units.<br>○ By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>Toppicks<br>○ By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2006 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2014 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>Rubber-Tired Gantry (RTG) Cranes<br>○ By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2003 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2004 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>○ By seven years after the effective date of a new lease amendment between the Tenant and the LAHD, four RTG cranes of model years 2005 and older shall be replaced with all-electric units, and one diesel RTG crane of model year 2005 shall be replaced with a diesel-electric hybrid unit with a diesel engine that meets or is lower than Tier 4 final off-road engine emission rates for PM and NOx.<br>Sweepers<br>○ Sweeper(s) shall be alternative fuel or the cleanest available by six years after the effective date of a new lease amendment between the Tenant and the LAHD.<br>Shuttle Buses<br>○ Gasoline shuttle buses shall be zero-emission units by seven years after the effective date of a new lease amendment between the Tenant and the LAHD. |
| Timing | During operation, as specified in the mitigation measure. |
| Methodology | LAHD will include this mitigation measure in new lease amendment with tenant. |

| | |
|---|---|
| Responsible Parties | Tenant, LAHD. |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **LM AQ-1. Cleanest Available Cargo-Handling Equipment.** Subject to zero and near-zero emissions feasibility assessments that shall be carried out by LAHD, with input from Tenant as part of the CAAP process, Tenant shall replace cargo handling equipment with the cleanest available equipment anytime new or replacement equipment is purchased, with a first preference for zero-emission equipment, a second preference for near-zero equipment, and then for the cleanest available if zero or near-zero equipment is not feasible, provided that LAHD shall conduct engineering assessments to confirm that such equipment is capable of installation at the terminal.<br>Starting one year after the effective date of a new lease amendment between the Tenant and the LAHD, tenant shall submit to the Port an equipment inventory and 10-year procurement plan for new cargo-handling equipment, and infrastructure, and will update the procurement plan annually in order to assist with planning for transition of equipment to zero emissions in accordance with the forgoing paragraph.<br>LAHD will include a summary of zero and near-zero emission equipment operating at the terminal each year as part of mitigation measure tracking. |
| Timing | Starting one year after the effective date of a new lease amendment between the Tenant and the LAHD, tenant shall submit to the Port an equipment inventory and 10-year procurement plan. |
| Methodology | LAHD will include this lease measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD. |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **LM AQ-2. Priority Access for Drayage.** A priority access system shall be implemented at the CS Terminal to provide preferential access to zero- and near-zero-emission trucks. |
| Timing | During operation. |
| Methodology | LAHD will include this lease measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD |
| Residual Impacts | Significant and unavoidable |
| Mitigation Measure | **LM AQ-3. Demonstration of Zero Emission Equipment.** Tenant shall conduct a one-year zero emission demonstration project with at least 10 units of zero-emission cargo handling equipment. Upon completion, tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero- emission technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030. |
| Timing | During operation. |
| Methodology | LAHD will include this lease measure in new lease amendment with tenant. |
| Responsible Parties | Tenant, LAHD |
| Residual Impacts | Significant and unavoidable |

# 3.1.6 Significant Unavoidable Impacts

## 3.1.6.1 Air Quality Impacts

Revised Project emissions of carbon monoxide (CO) would be significant and unavoidable in analysis years 2012, 2014, 2018 and 2023. Emissions of nitrogen oxides (NOx) would be significant and unavoidable in analysis years 2014, 2018, 2023, 2030 and 2036. Emissions of volatile organic compounds (VOC) would be significant and unavoidable in analysis years 2014, 2018, 2023, 2030, 2036 and 2045. Emissions of all other criteria pollutants would be less than significant.

Significant and unavoidable air quality impacts (ambient concentrations) of the Revised Project as summarized in Table 3.1-22 above are: $NO_2$ in analysis years 2014 and 2018; and $PM_{10}$ in 2014, 2018, 2023, 2030, 2036, and 2045.

### 3.1.6.2 Health Impacts

Significant and unavoidable health impacts of the Revised Project, as summarized in Table 3.1-22 and Figure 3.1-2, were predicted for individual cancer risk to be greater than 10 in a million in the immediate vicinity of the CS Container Terminal.