4.1 AIR QUALITY

This section discusses Project-related impacts to regional and local air quality in the vicinity of John Wayne Airport ("JWA" or "the Airport"). The air quality analysis in this section is based on the *John Wayne Airport Settlement Agreement Amendment Air Quality Technical Report* (*"Air Quality Technical Report"*) prepared by Environ International Corporation and included in this EIR as Appendix D (Environ 2014). The Technical Report includes acronyms and large data tables that are not repeated in this section. Impacts from greenhouse gas ("GHG") emissions are addressed in Section 4.3 of this EIR.

The Project does not propose any physical construction or change to the nature of the Airport ground operations. Therefore, the Project would not generate air pollutant emissions associated with construction activities.

4.1.1 BACKGROUND INFORMATION

AIR POLLUTANTS

Criteria Pollutants

Air quality is defined by ambient air concentrations of seven "criteria air pollutants" ("CAPs"), which are a group of common air pollutants identified by the U.S. Environmental Protection Agency ("USEPA") to be of concern with respect to the health and welfare of the general public. Federal and State governments regulate CAPs by using ambient standards based on criteria regarding the health and/or environmental effects of each pollutant. These pollutants include nitrogen dioxide ("NO_2"); ozone ("O_3"); particulate matter, including both particles equal to or smaller than 10 microns in size ("PM10") and particles equal to or smaller than 2.5 microns ("PM2.5"); carbon monoxide ("CO"); sulfur dioxide ("SO_2"); and lead. Particulate matter size refers to the aerodynamic diameter of the particle. A description of each CAP, including source types and health effects, is provided below.

Nitrogen Dioxide

Nitrogen gas, normally relatively inert (i.e., nonreactive), comprises about 80 percent of the air. At high temperatures (e.g., in combustion processes used to operate motor vehicles) and under certain other conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitrogen oxides ("NOx"). Nitric oxide ("NO"), NO_2, and nitrous oxide ("N_2O") are important constituents of NOx. NO is converted to NO_2 in the atmosphere.

NO_2 is a red-brown pungent gas and is toxic to various animals and to humans because of its ability to form nitric acid with water in the eyes, lungs, mucus membranes, and skin. In animals, long-term exposure to NOx increases susceptibility to respiratory infections, lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations of NO_2 can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes, and with hospital admissions for respiratory conditions.

NO and NO_2 are both precursors in the formation of O_3 and PM2.5, as discussed below. Because of this and the fact that NO emissions largely convert to NO_2, NOx emissions are typically examined when assessing potential air quality impacts.

Ozone

Ozone is a secondary pollutant, meaning that it is not directly emitted. It is a gas that is formed when volatile organic compounds ("VOCs") (also referred to as reactive organic gases) and NOx undergo photochemical reactions that occur only in the presence of sunlight. The primary source of VOC emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. NOx also forms as a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level O_3 to form; as a result, ozone is known as a summertime air pollutant. (Ground-level O_3 is not to be confused with atmospheric O_3 or the "ozone layer", which occurs very high in the atmosphere and shields the planet from some ultraviolet rays.) Ground-level O_3 is the primary constituent of smog. Because O_3 formation occurs over extended periods of time, both O_3 and its precursors are transported by wind, and high O_3 concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Particulate Matter

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are PM10 and PM2.5. Particulate matter tends to occur primarily in the form of fugitive dust. This dust appears to be generated by both local sources and by region-wide dust during moderate to high wind episodes. These regional episodes tend to be multi-district and sometimes interstate in scope. The principal sources of dust in urban areas are from grading, construction, disturbed areas of soil, and dust entrained by vehicles on roadways.

PM10 is generally emitted directly as a result of mechanical processes that crush or grind larger particles or from the re-suspension of dusts, most typically through construction activities and vehicular travels. PM10 generally settles out of the atmosphere rapidly and is not readily transported over large distances.

PM2.5 is directly emitted in combustion exhaust and is formed in atmospheric reactions between various gaseous pollutants including NOx, sulfur oxides ("SOx"), and VOCs. PM2.5 can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

The principal health effects of airborne particulate matter are on the respiratory system. Short-term exposure to high PM2.5 and PM10 levels is associated with premature mortality and increased hospital admissions and emergency room visits; increased respiratory symptoms are also associated with short-term exposure to high PM10 levels. Long-term exposure to high PM2.5 levels is associated with premature mortality and development of chronic respiratory disease. According to the USEPA, some people are much more sensitive than others to breathing PM10 and PM2.5. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths.

Carbon Monoxide

Carbon monoxide is a colorless and odorless gas which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches; aggravate cardiovascular disease; and impair central nervous system functions.

CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections; along heavily used roadways carrying slow-moving traffic; and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways.

Sulfur Dioxide

SOx constitute a class of compounds of which SO_2 and sulfur trioxide (“SO_3”) are of greatest importance. Ninety-five percent of pollution-related SOx emissions are in the form of SO_2. SOx emissions are typically examined when assessing potential air quality impacts of SO_2. The primary contributor of SOx emissions is fossil fuel combustion for generating electric power. Industrial processes, such as nonferrous metal smelting, also contribute to SOx emissions. SOx is also formed during combustion of motor fuels; however, most of the sulfur has been removed from fuels, greatly reducing SOx emissions from vehicles.

SO_2 combines easily with water vapor, forming aerosols of sulfurous acid (“H_2SO_3”), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (“H_2SO_4”). Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. SO_2 reacts with other chemicals in the air to form tiny sulfate particles which are measured as PM2.5.

Lead

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the body’s blood-forming (or hematopoietic), nervous, and renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological and gastrointestinal systems, although there is significant individual variability in response to lead exposure. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e., lead smelters) and are not applied to transportation projects.

Toxic Air Contaminants/Hazardous Air Pollutants/Chemicals of Potential Concern

Toxic air contaminants ("TACs") are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. TACs may be emitted from a variety of common sources, including motor vehicles, gasoline stations, dry cleaners, industrial operations, painting operations, and research and teaching facilities.

TACs are different than the CAPs previously discussed in that ambient air quality standards have not been established for them. Rather, TAC impacts are described by carcinogenic (i.e., cancer) risk and chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health. Diesel particulate matter ("diesel PM") is a TAC and is responsible for the majority of California's known cancer risk from outdoor air pollutants.

The USEPA uses the term "hazardous air pollutants" ("HAP") for TACs. Appendix D to this EIR and this section also use the term "chemicals of potential concern" ("COPC") for TACs.

4.1.2 REGULATORY SETTING

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

The Federal Clean Air Act ("CAA") requires the adoption of national ambient air quality standards ("NAAQS"), which are periodically updated to protect the public health and welfare from the effects of air pollution. Primary standards **s**et limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung disease (such as asthmatics), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. Current federal standards are set for SO_2, CO, NO_2, 0_3, PM10, PM2.5, and Lead.

The State of California Air Resources Board ("CARB") also has established additional standards, known as the California Ambient Air Quality Standards ("CAAQS"), which are generally more restrictive than the NAAQS.

The NAAQS and CAAQS applicable to this Project are shown in Table 4.1-1.

TABLE 4.1-1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California Standard	Federal Standard
O_3	1 hour	0.09 ppm (180 μg/m^3)	–
	8 hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)
PM10	24 hour	50 μg/m^3	150 μg/m^3
	Annual Arithmetic Mean	20 μg/m^3	–
PM2.5	24 hour	–	35 μg/m^3
	Annual	12 μg/m^3 15 μg/m^3 [c]	12.0 μg/m^3
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
NO_2	1 hour[a]	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)
	Annual	0.030 ppm (57 μg/m^3)	0.053 ppm 100 μg/m^3)
Lead	30-day average	1.5 μg/m^3	–
	Rolling 3-month average	–	0.15 μg/m^3
SO_2	1 hour[b]	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)
	3 hour[c]	–	0.5 ppm (1300 μg/m^3)
	24 hour	0.04 ppm (105 μg/m^3)	–
H_2S	1 hour	0.03 ppm (42 μg/m^3)	–
Vinyl Chloride	24 hour	0.01 ppm (26 μg/m^3)	–
Sulfates	24 hour	25 μg/m^3	–
Visibility-Reducing Particles	8 hour	Extinction coefficient of 0.23 per km (visibility of 10 miles or more due to particles when relative humidity is less than 70%)	–

O_3: ozone; ppm: parts per million; μg/m^3 - micrograms per cubic meter; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; CO: carbon monoxide; mg/m^3: milligrams per cubic meter; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; H_2S: hydrogen sulfide.

[a] To attain the federal 1-hour NO_2 standard, the 3-year average of the 98th percentile of the daily maximum.

[b] To attain the federal 1-hour SO_2 standard, the 3-year average of the 99th percentile of the daily maximum.

[c] This is a secondary standard. All other Federal standards shown are primary standards. However, the primary standards for O_3, PM10, 24-hour PM2.5, Annual NO_2, and Lead are also identified as secondary standards.

Source: *Air Quality Technical Report,* Table 2.2-1, Environ 2014, USEPA 2014.

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based upon the comparison of measured data with the NAAQS and CAAQS. When an area has been reclassified from a nonattainment to an attainment area for a federal standard, the status is identified as "maintenance", and there must be a plan and measures that will keep the region in attainment for the following ten years. Areas designated as "nonattainment" for purposes of NAAQS compliance are required to prepare regional air quality plans, which set forth a strategy for bringing an area into compliance with the standards. These regional air quality plans developed to meet federal requirements are included in an overall program referred to as the State Implementation Plan ("SIP"). The SIP process is described in Appendix D (see Section 2.2-1). Orange County's attainment status and the South Coast Air Basin ("SoCAB") SIP status are described in Sections 4.1.4 and 4.1.2 below, respectively.

FEDERAL

Aircraft Emissions

In addition to its authority to adopt, amend, and enforce the NAAQS, Section 233 of the CAA exclusively vests the authority to promulgate emission standards for aircraft or aircraft engines with the USEPA. States and other municipalities are preempted from adopting or enforcing any standard respecting aircraft engine emissions unless such standard is identical to USEPA's standards.

To date, the USEPA has adopted NOx emission standards for aircraft gas turbine engines with rated thrusts greater than 26.7 kilonewtons. (These types of engines are used primarily on commercial passenger and freight aircraft.) The requirements were previously adopted by the International Civil Aviation Organization ("ICAO"). Included in the rule are two new tiers of more stringent emission standards for NOx. These are referred to as Tier 6 standards and Tier 8 standards. The Tier 6 standards became effective for newly manufactured aircraft engines beginning in 2013. Engine models that were originally certificated beginning on or after January 1, 2014, must comply with the Tier 8 standards. (77 Fed.Reg. 36342-36386.) In addition, the USEPA has aircraft exhaust standards for NOx, hydrocarbons ("HC"), CO, and smoke.

Clean Air Act Conformity Rules

The 1990 amendments to Section 176 of the CAA required the USEPA to promulgate rules to ensure that federal actions conform to the appropriate SIP. The USEPA subsequently issued: (1) the Transportation Conformity Rule, which is a set of criteria and procedures for determining SIP conformity for transportation plans, programs and projects funded or approved under the *United States Code* or the Federal Transit Act; and (2) the General Conformity Rule, which requires any federal agency responsible for an action in a nonattainment area to determine that the action is either exempt from the General Conformity Rule's requirements or positively determine that the action conforms to the applicable SIP. Application of the General Conformity Rule is triggered by a "federal action," which is defined to include "any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that a department, agency or instrumentality of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves…"

The Project is not subject to the Transportation Conformity Rule, because it is not a transportation project as defined in the Rule. The Project also is not subject to the General Conformity Rule because no federal approvals or federal funding are required to implement the project. Additional discussion may be found in the *Air Quality Technical Study*, provided in Appendix D (see Section 2.2.4).

STATE

Mobile Source Reductions

Assembly Bill ("AB") 1493 ("the Pavley Standard" or "AB 1493") required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 through 2016. While AB 1493 focuses on the reduction of GHG emissions, this regulation contributes to the reduction of some CAPs.

CARB's approach to passenger vehicles (cars and light trucks), under AB 1493, combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. This approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California. These standards will apply to all passenger and light-duty trucks used by customers, employees of, and deliveries to the Project site.

Advanced Clean Cars

In January 2012, CARB approved the Advanced Clean Cars ("ACC") program, a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

REGIONAL

South Coast Air Quality Management District and Southern California Association of Governments

The South Coast Air Quality Management District ("SCAQMD") was created by the 1977 Lewis-Presley Act, which merged four county air pollution control bodies (i.e., Los Angeles, Orange, and Riverside Counties, and the non-desert portion of San Bernardino County) into one regional district for the SoCAB. In SoCAB, the SCAQMD is the agency responsible for protecting public health and welfare through the administration of federal and State air quality laws, regulations, and policies. Included in the SCAQMD's tasks are the monitoring of air pollution; the preparation of the Air Quality Management Plan ("AQMP") for the SoCAB; and the promulgation of rules and regulations. The AQMP includes strategies and tactics to be used to attain the NAAQS and CAAQS standards in SoCAB, whereas the rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts. The SCAQMD has established CEQA significance thresholds as discussed in Section 4.1.5.

Within the Project area, the Southern California Association of Governments ("SCAG") is the federally designated Metropolitan Planning Organization and the State-designated transportation planning agency for six counties: Riverside, San Bernardino, Los Angeles, Ventura, Imperial, and Orange.

The SCAQMD and SCAG are jointly responsible for formulating and implementing the AQMP for the SoCAB. SCAG's Regional Mobility Plan and Growth Management Plan form the basis for the land use and transportation control portion of the AQMP.

State Implementation Plan Status

The AQMP and SIP processes generally occur concurrently: The SIP is required under the CAA to provide the framework for non-attainment areas to come into attainment, and the AQMP is prepared by the SCAQMD, in part, to satisfy the requirement for a SIP. The AQMP traditionally evaluates all nonattainment and maintenance criteria pollutants; portions of the AQMP represent the required SIP elements, which are then transmitted to the CARB for review and approval before being transmitted to the USEPA for inclusion in the overall California SIP.

The SoCAB, including Orange County, is currently designated as nonattainment for the federal and State O_3 standards; the State PM10 standards; the federal and State PM2.5 standards; and the State NO_2 standards.[1] The current status of the SIPs for these non-attainment pollutants are shown below:

- The 2007 AQMP provides attainment demonstrations for the annual PM2.5 standard by April 5, 2015, and the 8-hour O_3 standard by December 31, 2023. In 2009 and 2011, respectively, at the request of the USEPA, CARB provided clarifying revisions to the annual PM2.5 and 8-hour O_3 SIP amendments. In 2011, the USEPA approved the control strategy, emission reduction commitment, and attainment demonstration for the annual PM2.5 standard by April 5, 2015. In 2012, the USEPA approved the control strategy, emission reduction commitment, and attainment demonstration for the annual 8-hour O_3 standard by June 15, 2024.

- The 2012 AQMP provides attainment demonstrations for the 24-hour PM2.5 standard by 2019 and the 1-hour O_3 standard by 2023. In addition, it provides supplemental information for the approved 8-hour O_3 SIP. On January 25, 2013, CARB approved the 2012 AQMP, which was subsequently submitted to the USEPA. To date, the 2012 AQMP has not been formally approved by the USEPA. However, the 2012 AQMP is still considered by the SCAQMD as the current and approved AQMP.

4.1.3 METHODOLOGY

The basic steps conducted in performing this air quality analysis are as follows: (1) develop emissions inventories for existing conditions (2013) and future conditions (2016 through 2020, 2021 through 2025, and 2026 through 2030); (2) perform air dispersion modeling for pollutant concentrations; and (3) assess the Project's impact relative to the SCAQMD's numeric thresholds and the criteria of the State CEQA Guidelines, Appendix G.

EMISSIONS AND DISPERSION MODELS

Emissions Dispersion and Modeling System

The Emissions Dispersion and Modeling System ("EDMS") 5.1.4 was used to quantify CAP and TAC emissions from aircraft and CAP emissions from auxiliary power units ("APUs") and ground support equipment ("GSE"). The EDMS is a combined emissions and dispersion model for assessing air quality at civilian airports and military air bases. The model was developed by the Federal Aviation Administration ("FAA") in cooperation with the United States Air Force. The

1 The Los Angeles County portion of the SoCAB is designated nonattainment for lead; the remainder of the SoCAB is designated attainment.

model is used to produce an inventory of emissions generated by sources on and around the airport or air base, and to calculate pollutant concentrations in these environments.

The EDMS calculates CAP and TAC emissions for several types of airport sources, based on aircraft engine performance, times in mode, and landing-takeoff cycles ("LTOs") by engine type for each inventory. The EDMS incorporates both USEPA-approved emissions inventory methodologies and dispersion models to ensure that analyses performed with the application conform to USEPA guidelines. Appendix B of Appendix D contains the EDMS input files for the Project and all alternatives.

California Emission Estimator Model™

The California Emissions Estimator Model ("CalEEMod™") Version 2013.2.2 was used to quantify the CAP emissions from vehicle traffic. CalEEMod calculates CAP emissions for projects located in California and was developed under the auspices of the SCAQMD upon receiving input from other California air districts.

CalEEMod utilizes widely accepted models for emissions estimates combined with appropriate default data that can be used if site-specific information is not available. For example, CalEEMod incorporates the USEPA-developed emission factors; CARB's on-road and off-road equipment emission models such as EMFAC and OFFROAD; and studies commissioned by California agencies, such as the California Energy Commission ("CEC") and the California Department of Resources Recycling and Recovery ("CalRecycle"). (EMFAC is an emissions factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles, haul trucks). OFFROAD is an emissions factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment).

As for the CalEEMod default values and existing regulation methodologies, the program is set to be customized for use in each specific local air district region. The air quality analysis presented in this EIR used default factors for Orange County, unless otherwise noted in the methodology descriptions below. The CalEEMod output files are provided for reference in Appendix C of Appendix D.

AERMOD

The American Meteorological Society/USEPA Regulatory Model Improvement Committee Model ("AERMOD") Version 12345 was used to model the air dispersion of pollutants from the Project site and from off-site ambient air concentrations in order to evaluate compliance with the NAAQS and CAAQS. This model, which has been approved for use by USEPA, CARB, and SCAQMD, incorporates multiple variables in its algorithms including:

- Meteorological data representative of surface and upper air conditions;
- Local terrain data to account for elevation changes;
- Physical specification of emission sources including information such as:
    - Location;
    - Release height; and
    - Source dimensions.

Dispersion model averaging times are specified based on the averaging times of ambient air quality standards and the air quality significance thresholds established by the appropriate regulatory agencies. Averaging times include 1-hour, 24-hour, and annual for the various pollutants. Dispersion modeling was performed using the maximum daily emissions and the complete five-year meteorological data set to evaluate short-term impacts, thereby ensuring that all likely meteorological conditions are considered. This approach is conservative, since it assumes that maximum daily emissions could occur on any day, even though there is a low probability that worst-case meteorological conditions would occur at exactly the same time as when the maximum emissions would occur.

Source Characterization

Two different types of emission sources are used in the air dispersion model: area sources and point sources. Sources that can be reasonably represented as emitting pollutants at a uniform rate over a two-dimensional surface (e.g., dust from a roadway) are modeled as area sources. The area sources modeled included Class A and E aircraft LTOs, APUs at taxiways, and on-site terminal traffic. Sources that emit pollutants from smokestacks are modeled as point sources. The cogeneration facility ("CoGen") stacks were modeled as a point source.

Appendix D (see Figure 2) shows the locations of the on-site terminal traffic roadways, runways, taxiways, and CoGen stacks that were included in the air dispersion model. The surrounding buildings near the CoGen stacks are also shown so that the building downwash effects would be appropriately represented.

Modeling details relative to source configuration, temporal factors, and emission rates are described in Appendix D (see Section 3.2.1.1).

Meteorology

The SCAQMD provides AERMOD model-ready meteorological data sets for use in air quality and risk impact analyses in the SoCAB. SCAQMD's Costa Mesa meteorological data set was selected based on that station's geographic proximity to the Project site. The SCAQMD meteorological data set for January 1, 2007 to December 31, 2011 (the most recent data set available) was used for the analysis. The data set included ambient temperature, wind speed, wind direction, atmospheric stability, and mixing height parameters. Calm wind conditions were included in the modeling analysis consistent with guidance provided by SCAQMD. Appendix D (see Figure 3) depicts the wind rose for the Costa Mesa station.

Receptors

The following receptors are included in the AERMOD model:

- Fence line receptors 25 meters ("m") apart;
- Fine grid 25 m x 25 m located up to 200 m from the fence line;
- Coarse grid 100 m x 100 m in the area from 200 m to 1,000 m from the fence line; and
- Sensitive receptors are gridded receptors in residential areas, as well as discrete receptors, including long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities, within 1,000 m of the project boundary.

The locations of all sensitive receptors are illustrated on Exhibit 4.1-1. Criteria pollutant impacts were evaluated at receptors where a person can be situated for an hour or longer at a time. Additional details relative to modeled receptors are described in Appendix D (see Sections 3.2.1.4 and 3.3.1).

Background Concentrations

In order to determine if the concentrations of CO and NO_2 (attainment pollutants) would be below the ambient air quality standards, the maximum concentrations for NO_2 and CO from 2008-2012 at the Anaheim and Costa Mesa monitoring stations were determined from the data in Tables 4.1-2 and 4.1-3. These concentrations were then added to the maximum modeled concentrations for these pollutants to determine the combined modeled and background concentrations. The other pollutants evaluated (i.e., PM_{10}, $PM_{2.5}$) have incremental thresholds and thus the results are not added to background concentrations.

HEALTH RISK ASSESSMENT

The Health Risk Assessment ("HRA") was conducted in accordance with CARB's Air Toxics Hot Spots Program Risk Assessment Guidelines and is consistent with risk assessment guidance documents issued by USEPA and the California Environmental Protection Agency ("CalEPA") Department of Toxic Substances Control. Simplifying assumptions were also obtained from the SCAQMD risk assessment guidelines.

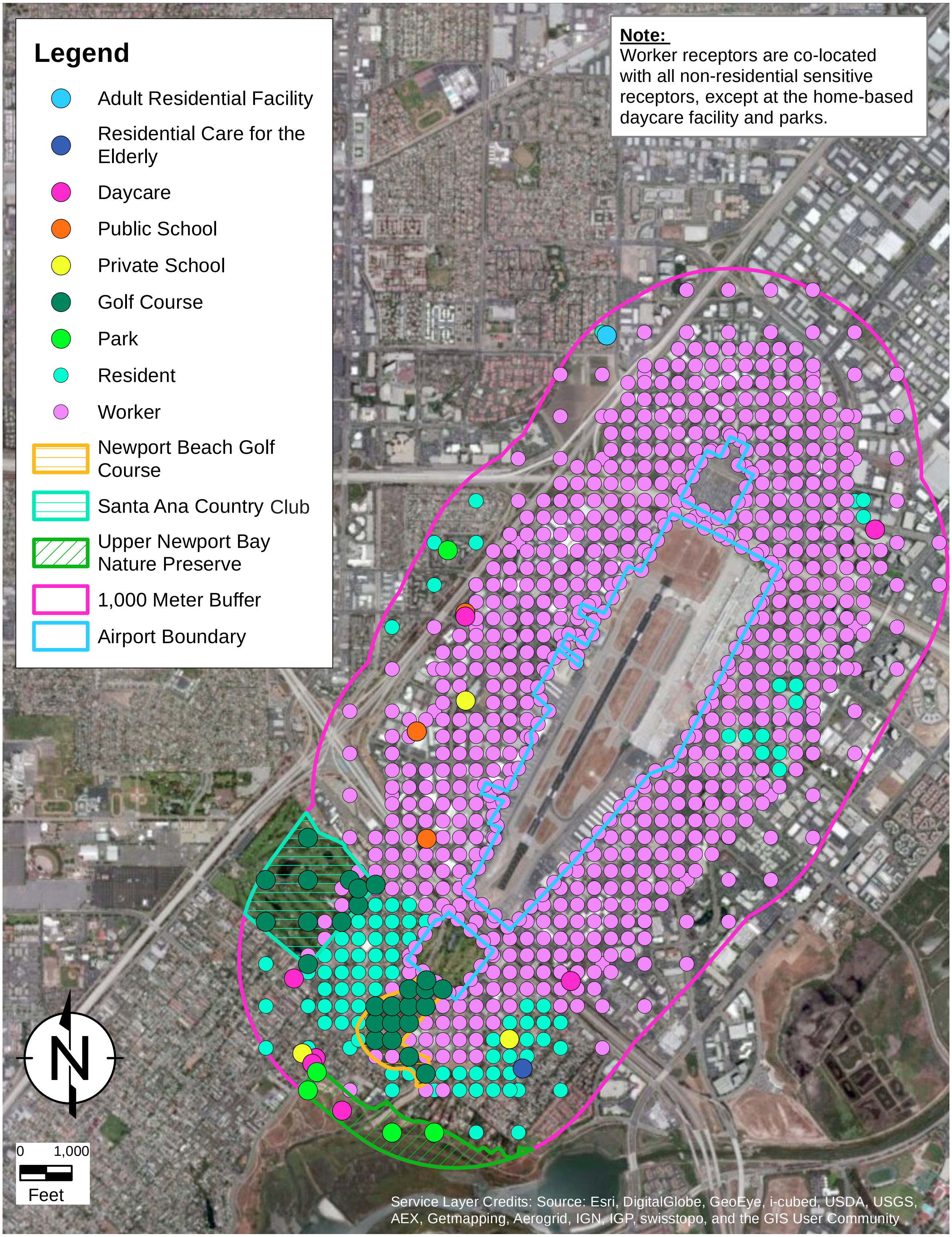
Health Effects Categories

Compounds were evaluated for their potential health effects in two categories, carcinogenic and non-carcinogenic. Many compounds produce non-carcinogenic effects at sufficiently high doses, but only some compounds are associated with carcinogenic effects. Most regulatory agencies consider carcinogens to pose a risk of cancer at all exposure levels (i.e., a "no-threshold" assumption); that is, any increase in dose is assumed to be associated with an increase in the probability of developing cancer. In contrast, non-carcinogens generally are thought to produce adverse health effects only when some minimum exposure level is reached (i.e., a threshold). TAC modeled concentrations were used to calculate cancer risk, chronic hazard index ("HI"), and acute HI at each relevant receptor.

Cancer Risk Receptor Exposure

Per SCAQMD HRA guidance for cancer risk analysis, a continuous exposure of 24 hours per day, 350 days per year for a 70-year lifetime is assumed for residents. This is a highly conservative assumption, since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this analysis assumes that residents are experiencing outdoor concentrations for the entire exposure period. The 24 hours per day, 350 days per year for a 70-year period exposure is also assumed for non-residential sensitive receptors, such as daycare centers, schools, hospitals, and other care facilities.

For occupational receptors, SCAQMD guidance suggests that the exposure be based on 8 hours per day, 5 days per week, 245 working days per year, and a 40-year working lifetime. This is a conservative assumption, since most people do not remain at the same job for 40 years. The SCAQMD also suggests specific daily breathing rates and exposure value factors for estimating cancer risks.



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Source: *Air Quality Technical Report*, Environ 2014

Air Dispersion Modeled Receptor Locations

Exhibit 4.1-1

John Wayne Airport Settlement Agreement Amendment

(4-09-2014 JAZ) R:\Projects\JWA\J003\Graphics\EIR\Ex4.1-1_AirdispersionModeledReceptorLocations.pdf

Incremental cancer risks are compared to the risk significance threshold of greater than or equal to ten in a million (1 x 10^{-5}) pursuant to the SCAQMD CEQA Significance Thresholds, which is also consistent with the California Air Toxics "Hotspots" Assessment and Information Act (AB2588). The cancer burden is estimated by identifying the area where the incremental cancer risk is greater than or equal to one in a million. The population in this area is estimated based on a population density of 7,000 persons per square kilometer, which was assumed based on SCAQMD's risk assessment guidance.

Chronic and Acute Hazard Index

The potential for non-carcinogenic (chronic/acute) health effects is evaluated by calculating the total HI for the Project emissions. This HI represents the sum of the hazard quotients (HQs) developed for each individual chemical. The chronic HI and acute HI, which represent the exposure to multiple contaminants, are compared to a hazard threshold of greater than or equal to one (1.0) pursuant to the SCAQMD CEQA Significance Thresholds. An HI greater than or equal to one indicates that exposure to contaminants from the Project may cause adverse health effects in exposed populations. It is important to note, however, that the level of concern associated with exposure to non-carcinogenic compounds does not increase linearly as the HI exceeds one. Typically, compound-specific HQs are summed to calculate pathway-specific HI values. Thus, the result is a conservative representation of the maximum HI.

Uncertainty Characterization

In any risk evaluation, a number of assumptions are made in order to estimate human exposure and to calculate potential risks. These assumptions may, however, introduce uncertainty in risk calculations. Regulatory guidance requires that conservative assumptions be used to provide an upper-bound estimate of the risk and to avoid underestimating the potential exposures and associated health risks.

Conservative assumptions are made in this assessment as noted in the *Air Quality Technical Report*, provided in Appendix D. Thus, estimated excess cancer risks are upper-bound estimates and the actual incidence of cancer is likely to be lower.

Additional model details relative to toxicity factors, identification of COPCs, exposure assessment, and risk characterization are included in Appendix D (see Section 3.2).

PROJECT SOURCES OF AIR POLLUTANTS

Aircraft

Aircraft operational emissions are based on Project-specific projections of aircraft landings and takeoffs, and were modeled using the EDMS. The aircraft data included 44 potential aircraft types, as summarized in Appendix D (see Table 3.1-2), with varied aircraft classifications and engine types.

Note that the analysis conservatively assumes the continuation of the existing fleet mix for the entire Project term. Given the length of this planning timeframe (i.e., through 2030), it is reasonable to assume that there will be some fleet turnover and interest in introducing newer and next generation aircraft, which are anticipated to be more fuel efficient and produce less emissions. That being said, because of the uncertainty regarding the specifics of the emission benefits attributable to the next generation of aircraft and because of the uncertainty regarding the timing of the introduction of those aircraft into the commercial market, the maximum environmental impact assumption of no improvement in the fleet's emission characteristics has been made.

Additional inputs to the EDMS model included:

- LTO estimates for commercial aviation and general aviation aircraft, including cargo aircraft (see Appendix D, Table 3.1-3);
- The EDMS default times-in-mode for approach, takeoff and climb out, which vary by aircraft (see Appendix D, Table 3.1-4); and
- Taxi time, including landing roll time, based on data estimated for JWA (see Appendix D, Table 3.1-5).

Emission factors for each aircraft type are the EDMS defaults.

Auxiliary Power Units

The EDMS was used to calculate emissions from APUs utilizing EDMS default APU assignments (engine type/horsepower) by aircraft class. JWA-specific taxi time data, however, was used for APU run time for each LTO. APUs were assumed to not operate while airplanes are at the gate, since the aircraft are plugged in for electricity and preconditioned air.

Ground Support Equipment

GSE includes air conditioners, air starts, aircraft tractors, baggage tractors, belt loaders, cabin service trucks, cargo loaders, catering trucks, forklifts, fuel trucks, hydrant trucks, lavatory trucks, service trucks, and water service equipment. CAP emissions were estimated based on the EDMS defaults for each aircraft class (see Appendix D, Table 3.1-9 for the default aircraft GSE assignments). The EDMS defaults include fuel type, operating time, horsepower, and load factor. However, the analysis utilized information on actual, existing GSE fuel types, in order to estimate emission reductions from electrification for specific GSE types. The analysis incorporates the Airport's commitment to increase the percentage of electrified GSE from baseline conditions by 15 percent for Phase 1, by 35 percent for Phase 2, and 50 percent for Phase 3; this commitment is set forth in mitigation measure AQ/GHG-7(i).

Mobile Sources

The emissions inventory includes three types of mobile sources: vehicles in the JWA parking lots and structures; passenger-related terminal and off-site traffic; and JWA-owned vehicles and equipment.

This analysis conservatively does not quantify emissions reductions from the Pavley Standard or the Advanced Clean Cars program, which are expected to reduce the emissions estimated from mobile sources.[2]

2 CalEEMod includes the Pavley Standard for GHG emissions, but not criteria pollutant emissions.

Parking Lots

Emissions for parking lot activity were calculated in accordance with the methodology outlined in the EDMS. The related inputs included idling time, distance traveled (based on parking lot size), and total number of vehicles entering and exiting per hour of day. Idling and speed assumptions are specific to JWA, and parking lot volumes for existing traffic were provided in the Project traffic analysis (see Appendix G). Parking lot activity for each phase was estimated by scaling the ratio of the Million Annual Passengers ("MAP") for each Phase to the Baseline MAP. It was assumed that the Parking Structure C2 extension would be completed by the beginning of Phase 1 of the Project. Emission factors are from EMFAC 2011. Appendix D includes parking lot vehicle counts by phase (see Table 3.1-11) and emission factors for the parking lot vehicles (Table 3.1-12).

Terminal Traffic

CAP emissions from terminal traffic, including off-site traffic, were calculated from trip generation rates and average trip lengths provided in the Project's traffic impact analysis (see Appendix G). CalEEMod emission factors for each phase year (2016, 2021, and 2026) were used to estimate Project CAP emissions. Appendix D provides an overview summary of the CalEEMod inputs and trip generation attributes (see Table 3.1-14).

John Wayne Airport Vehicles and Equipment

Vehicles associated with the Airport's day-to-day operations include landside and airside vehicles owned and operated by the Airport and by third parties (e.g., on-site maintenance trucks, shuttle services, employee and passenger transportation, taxis, and off-road equipment not included in GSE above). The estimated emissions are based on site-specific data, including a list of equipment/vehicles, horsepower or model year, annual mileage/operating hours, fuel type, and fuel consumption totals.

John Wayne Airport-Owned Vehicles

CAP emissions from JWA owned and operated on-road vehicles were calculated by utilizing vehicle model year and annual mileage information specific to JWA. Appendix D presents the CAP emission factors for this source type on a vehicle-by-vehicle basis, based on EMFAC2011 emission factors (see Table 3.1-16a).

John Wayne Airport-Owned Airside Equipment

CAP emissions from JWA owned and operated (non-GSE) off-road equipment were calculated by utilizing equipment-specific horsepower and activity data (hours) specific to JWA. Appendix D presents the CAP emission calculations for this source type on a vehicle-by-vehicle basis, based on OFFROAD2011 emission factors (see Table 3.1-17a).

Stationary Sources

CAP emissions from JWA stationary source equipment were estimated for two categories. The first category includes sources such as heaters/boilers, emergency engines, steam washers, surface cleaners, cooling towers, and gasoline and diesel dispensing tanks. The stationary source estimates are based on site-specific emission estimates for the Baseline and are scaled based on

Class A Average Daily Departures ("ADDs") for each Phase of the Proposed Project and alternatives.

The second category of stationary sources is the CoGen, which is a primary source of electricity at the Airport terminal. The CoGen is fueled by natural gas, and thus it generates direct CAP emissions. CoGen usage from the Baseline condition was used to estimate the Project's CoGen emissions. The CoGen-related emissions were assumed to increase in proportion to the increase in MAP due to an estimated increase in electricity demand. The increased demand in electricity was based on the derivation of the electricity required in the Baseline condition per MAP, which was estimated due to the differences in electrical demand between the day and nighttime (when there are no passengers).

Appendix D identifies the CoGen's operating parameters that are relevant to this analysis, including electricity demand by time of day (Table 3.1-19). Based on this information, the electricity generation for the CoGen was estimated for each Phase of the Proposed Project and alternatives, as shown in Appendix D (see Table 3.1-20).

4.1.4 EXISTING CONDITIONS

CLIMATE AND METEOROLOGY

Climate in the SoCAB is determined by its terrain and geographical location. The SoCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern border and high mountains surround the rest of the SoCAB. The region lies in the semi-permanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter-wet season. This weather pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, or Santa Ana winds do exist.

Although the SoCAB has a semi-arid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly Santa Ana winds from the mountains and deserts northeast of the SoCAB. Summer wind flow patterns represent maximum environmental impact conditions, as this is the period of higher temperatures and more sunlight, which results in ozone formation.

LOCAL AIR QUALITY MONITORING DATA

The SCAQMD maintains ambient air quality monitoring stations throughout the SoCAB. The Costa Mesa Monitoring Station is the station closest to the Project site, approximately 3 miles west of JWA. The Costa Mesa Monitoring Station monitors CO, NO_2, O_3, and SO_2 levels; particulate concentrations are not monitored at this station. PM10 and PM2.5 concentrations are monitored at the Anaheim Monitoring Station, approximately 11 miles north of JWA. Tables 4.1-2 and 4.1-3 list the most recent five years of published data at the Costa Mesa and Anaheim Monitoring Stations.

TABLE 4.1-2
AIR QUALITY DATA FOR COSTA MESA MONITORING STATION

Pollutant	2008	2009	2010	2011	2012
O_3					
Maximum Concentration 1-hr period, ppm	0.094	0.087	**0.097**	0.093	0.090
Maximum Concentration 8-hr period, ppm	**0.079**	**0.072**	**0.076**	**0.077**	**0.076**
Annual 4th Highest Daily maximum over 3 years	0.073	0.065	0.060	0.063	0.059
Number of Exceedances, California Standard Concentration 1-hr period	0	0	1	0	0
Number of Exceedances, California Standard Concentration 8-hr period	6	3	2	1	1
Number of Exceedances, National Standard Concentration 8-hr period	3	0	1	1	1
CO					
Maximum Concentration 1-hr period, ppm	3	3	2	3	2
Maximum Concentration 8-hr period, ppm	2.0	2.2	2.1	2.2	1.7
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard Concentration 8-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 8-hr period	0	0	0	0	0
NO_2					
Maximum Concentration 1-hr period, ppm	0.081	0.065	0.070	0.061	0.074
98th Percentile Daily Maximum Concentration 1-hr period, ppm	0.064	0.057	0.056	0.053	0.051
AAM, ppm	0.013	0.013	0.011	0.010	0.010
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard AAM	0	0	0	0	0
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, National Standard AAM	0	0	0	0	0
SO_2					
Maximum Concentration 1-hr period, ppm	0.009	0.009	0.010	0.008	0.006
Maximum Concentration 24-hr period, ppm	0.003	0.003	0.002	0.001	0.001
AAM, ppm	0.001	0.004	N/A	N/A	N/A
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard Concentration 24-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0

TABLE 4.1-2
AIR QUALITY DATA FOR COSTA MESA MONITORING STATION

Pollutant	2008	2009	2010	2011	2012
Number of Exceedances, National Standard Concentration 24-hr period	0	0	0	0	0
Number of Exceedances, National Standard AAM	0	0	0	0	0

O_3: ozone; hr: hour; ppm: parts per million; CO: carbon monoxide; NO_2: nitrogen dioxide; AAM: Annual Arithmetic Mean; SO_2: sulfur dioxide; N/A: insufficient data available.

Bold values are data that exceed the standards.

Source: *Air Quality Technical Report,* Table 2.1-1, Environ 2014.

TABLE 4.1-3
AIR QUALITY DATA FOR ANAHEIM MONITORING STATION

Pollutant	2008	2009	2010	2011	2012
O_3					
Maximum Concentration 1-hr period, ppm	**0.105**	0.093	**0.104**	0.088	0.079
Maximum California Concentration 8-hr period, ppm	**0.086**	**0.077**	**0.088**	**0.072**	0.067
Annual 4th Highest Daily maximum over 3 years, ppm	0.076	0.068	0.060	0.064	0.065
Number of Exceedances, California Standard Concentration 1-hr period	2	0	1	0	0
Number of Exceedances, California Standard Concentration 8-hr period	10	2	1	1	0
Number of Exceedances, National Standard Concentration 8-hr period	4	1	1	0	0
CO					
Maximum Concentration 1-hr period, ppm	4	3	3	3	3
Maximum Concentration 8-hr period, ppm	3.4	2.7	2.0	2.1	2.3
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard Concentration 8-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 8-hr period	0	0	0	0	0
NO_2					
Maximum Concentration 1-hr period, ppm	0.093	0.068	0.073	0.074	0.067
98th Percentile Daily Maximum Concentration 1-hr period, ppm	0.073	0.062	0.061	0.061	0.054
AAM, ppm	0.020	0.018	0.018	0.017	0.015
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard AAM	0	0	0	0	0

TABLE 4.1-3
AIR QUALITY DATA FOR ANAHEIM MONITORING STATION

Pollutant	2008	2009	2010	2011	2012
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, National Standard AAM	0	0	0	0	0
PM10					
Maximum Concentration 24-hr period, μg/m³	**61**	**63**	43	**53**	48
AAM, μg/m³	**28.6**	**30.9**	**22.4**	**24.8**	**22.4**
Number of Exceedances, California Standard 24-hr period	3	1	0	2	0
Number of Exceedances, California Standard AAM	1	1	1	1	1
Number of Exceedances, National Standard Concentration 24-hr period	0	0	0	0	0
PM2.5					
Maximum Concentration 24-hr period, μg/m³	31.0	32.0	25.0	28.0	25.0
AAM, μg/m³	**13.7**	11.8	10.2	11.0	10.8
Number of Exceedances, National Standard Concentration 24-hr period	0	0	0	0	0
Number of Exceedances, National Standard AAM	0	0	0	0	0
Number of Exceedances, California Standard AAM	1	0	0	0	0

O_3: ozone; hr: hour; ppm: parts per million; CO: carbon monoxide; NO_2: nitrogen dioxide; AAM: Annual Arithmetic Mean; PM10: respirable particulate matter with a diameter of 10 microns or less; μg/m³: micrograms per cubic meter; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Bold values are data that exceed the standards.

Source: *Air Quality Technical Report,* Table 2.1-2, Environ 2014.

As shown in Tables 4.1-2 and 4.1-3:

- CO, NO_2, and SO_2 levels were below the State and federal standards at the Costa Mesa monitoring station; CO and NO_2 levels were below the State and federal standards at the Anaheim monitoring station.

- O_3 levels exceeded the State one-hour standard in 2008 (Anaheim only) and 2010 (Costa Mesa and Anaheim); O_3 levels exceeded the State eight-hour standard in all of the past five years for both air monitoring stations, except for 2012 at the Anaheim Monitoring Station; O_3 levels exceeded the federal eight-hour standard four of the last five years at the Costa Mesa Monitoring Station and three of the last five years at the Anaheim Monitoring Station.

- The 4th highest O_3 levels, which are the concentrations used when determining attainment of the eight-hour standard, were below the federal standard at both air monitoring stations.

- PM10 levels at the Anaheim Monitoring Station exceeded the State 24-hour standard in all years except 2010 and 2012. In addition, PM10 levels at the Anaheim Monitoring Station exceeded the State annual mean standard in all years from 2008–2012.

- PM2.5 levels at the Anaheim Monitoring Station exceeded the State annual standard in 2008. From 2008 to 2012, there were no exceedances of the federal 24-hour or annual standard at the Anaheim Monitoring Station.

ATTAINMENT STATUS

As described in Section 4.1.2, specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based upon the comparison of measured data with the NAAQS and CAAQS. Table 4.1-4, National and California Ambient Air Quality Standard Attainment Status, summarizes the attainment status of Orange County for the pollutants regulated by the NAAQS and CAAQS. As seen in Table 4.1-4, Orange County is currently in attainment (or unclassified or maintenance) for the federal 24-hour PM10 standard; the federal and State CO standards; the federal NO_2 standards; the federal and State lead standards; the federal and State SO_2 standards; and the State hydrogen sulfide, vinyl chloride, sulfates, and visibility-reducing particles standards. However, as also shown in Table 4.1-4, Orange County is currently designated as a nonattainment area for the federal and State O_3 standards ("extreme" 1-hour standard); the State PM10 standards; the federal and State PM2.5 standards; and the State NO_2 standards.

TABLE 4.1-4
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARD ATTAINMENT STATUS

Pollutant	Averaging Period	Orange County Attainment Status	
		California Standard	Federal Standard
O_3	1 hour	Extreme Non-Attainment	–
	8 hour	Non-Attainment	Extreme Non-Attainment
PM10	24 hour	Non-Attainment	Attainment (Maintenance)
	Annual	Non-Attainment	–
PM2.5	24 hour	–	Non-Attainment
	Annual	Non-Attainment	Non-Attainment
CO	1 hour	Attainment	Attainment (Maintenance)
	8 hour	Attainment	Attainment (Maintenance)
NO_2	1 hour	Non-Attainment	Maintenance
	Annual	Non-Attainment	Maintenance
Lead	30 day average	Attainment	–
	Rolling 3-month average	–	Attainment

TABLE 4.1-4
NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARD ATTAINMENT STATUS

Pollutant	Averaging Period	Orange County Attainment Status	
		California Standard	Federal Standard
SO_2	1 hour	Attainment	Attainment
	3 hour	–	Attainment
	24 hour	Attainment	–
H_2S	1 hour	Unclassified	–
Vinyl Chloride	24 hour	Unclassified	–
Sulfates	24 hour	Attainment	–
Visibility-Reducing Particles	8 hour	Unclassified	–

O_3: ozone; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; H_2S: hydrogen sulfide; –: no standard.

Source: *Air Quality Technical Report,* Table 2.2-2, Environ 2014.

BASELINE CRITERIA AREA POLLUTANT EMISSIONS

The Baseline/existing condition CAP emissions at the Airport were calculated, as described in Section 4.1.3 and as shown in Table 4.1.5.

TABLE 4.1-5
BASELINE CRITERIA POLLUTANT EMISSIONS

Source	Emissions (lbs/day)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Aircraft	634.0	2,091	19,286	241.3	75.2	75.2
GSE	33.9	140.2	825.7	2.7	4.9	4.7
APUs	3.0	55.3	47.5	7.5	5.9	5.9
Airside	2.5	3.1	16.5	0.6	0.2	0.2
Traffic	229.6	678.3	3,059	6.3	467.4	132.4
Parking Lots	130.5	19.9	144.4	0.08	0.7	0.5
Stationary Sources	17.0	10.2	74.0	0.6	10.2	10.2
Total	**1,050**	**2,998**	**23,453**	**259.0**	**564.5**	**229.0**

lbs/day: pound/day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units.

Source: *Air Quality Technical Report,* Table 5.1-1, Environ 2014.

As shown in Table 4.1-5, aircraft operating at JWA currently are the primary source of the maximum daily emissions of VOCs, NOx, CO and SOx, whereas traffic associated with the Airport is the primary source of the maximum daily emissions of PM10 and PM2.5.

HEALTH RISK WITHIN THE AIR BASIN

The SCAQMD has conducted several phases of the Multiple Air Toxics Exposure Study ("MATES") to characterize health risks potentially posed by TACs in the SoCAB. The first such study ("MATES-I") was conducted in 1987. During 1998–1999, MATES-II was conducted as part of the Environmental Justice Initiatives adopted by SCAQMD's Governing Board in October 1997. MATES-II was a landmark urban air toxics monitoring and evaluation study that included a comprehensive monitoring program; compilation of an updated TAC emissions inventory; and urban and local scale air quality modeling to characterize SoCAB risk.

During 2004–2006, SCAQMD conducted the MATES-III study. In September 2008, the SCAQMD released a final MATES-III report, which estimated that the basin-wide cancer risk was about 1,200 in a million, with TACs from mobile sources accounting for 94 percent of this risk on average.

The SCAQMD also conducted air quality modeling to calculate TAC concentrations and thus risk throughout the SoCAB for 2005. Interactive maps showing model-calculated cancer risks are available on SCAQMD's website. The SCAQMD calculated that TAC cancer risk in the Basin is 1,200 in a million, and ranges from 510 to 1,233 in a million within ½ mile of the Project site. Generally, SCAQMD found that the primary source of risk was due to diesel PM, and that higher risks were found along transportation corridors and freeways.

BASELINE CHEMICALS OF POTENTIAL CONCERN EMISSIONS

The Baseline/existing condition emissions of 94 COPC from commercial aviation, general aviation, GSE, and APUs were calculated as described in Section 4.1.3. The results are tabulated in Appendix D (see Table 5.1-2).

PARTICULATE AIR MONITORING IN NEWPORT BEACH

The City of Newport Beach performed a study entitled "Field Measurements of Ambient Particles and Associated Trace Elements and Hydrocarbons". (Boyle 2010). The study indicates that the purpose was to "measure airborne concentrations of particulate pollutants, and to characterize the chemical composition of these particles, at different locations in the City of Newport Beach, California." Data was collected at six locations over approximately five sampling dates (five of the six sites had samples taken on three different days, and one site had one sample taken). The study concludes that the data "indicate that ambient PM2.5 [concentration] at the locations sampled in the City of Newport Beach is well within federal air quality standards". (Section I, Research Summary). The study also indicates that it was "designed as a preliminary assessment of the feasibility of using field air sampling to detect differences in the amounts and chemical composition of PM2.5 in relation to various sources. These objectives were met." While the study suggests larger-scale sampling may be useful, no further conclusions were presented regarding this issue.

EXISTING EMISSIONS REDUCTION STRATEGIES

The Airport Cooperative Research Program's ("ACRP") Report 56, *Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports* is a handbook and decision support tool that assists airport operators in identifying, evaluating, prioritizing, and implementing practical, low-cost strategies to reduce and manage greenhouse gas (GHG) emissions. However, many of the GHG emission reduction measures also provide reductions of CAPs and TACs. The ACRP report identifies strategies in 12 categories. Many of these strategies are currently implemented at JWA, as shown in Table 4.1-6.

TABLE 4.1-6
EMISSION REDUCTION STRATEGIES CURRENTLY IMPLEMENTED AT JWA

Strategy Number	Strategy Name	Implementation Status
AF-01	Provide Infrastructure for Pre-Conditioned Air (PCA) and Ground Power	All regular gates (Gates 2-21) at JWA are currently equipped with PCA and ground power.
AF-02	Minimize the Use of Auxiliary Power Units (APUs)	All of the regular gates (Gates 2-21) at JWA are equipped with PCA and ground power, which minimizes the use of APUs. In addition, the commercial airlines at JWA push back the aircraft from the gates, further reducing APU usage.
AF-03	Design Airside Layout to Reduce Aircraft Delay and Surface Vehicle Congestion	The Airport's airside layout minimizes aircraft delay by providing for efficient access between the single commercial carrier runway and the terminal complex.
AF-04	Design Runways, Taxiways, Ramps & Terminals to Reduce Aircraft Taxiing Distances	In light of the airside layout design, the Airport's average total taxi time is 15.38 minutes for commercial aircraft, and 9.55 minutes for general aviation aircraft.
AF-06	Install or Expand Hydrant Fueling System	JWA has installed hydrant fueling at all regular gates (Gates 2-21). The regional/commuter flight aircraft that operate out of Gates 1A, B & C and 22A, B, & C are fueled via fuel tanker trucks because it is infeasible to fuel them by hydrant as they are too small and spaced too closely together.
AF-08	Create Partnerships with Intercity Rail Services to Optimize Passenger and Cargo Movement	Public transportation from the Tustin train station to JWA already is available for passenger movement. The provision of additional rail service for cargo movement is not needed because JWA has a limited number of authorized cargo flights (4 ADDs).
AF-15	Support Alternative Passenger Boarding Procedures	The current boarding procedures utilized by the commercial airlines already use the most efficient methods.
AF-16	Support Push Back Tugs to Transport Planes to Taxiways, Runway Ends, and/or Take-off Areas	The commercial airlines currently implement these practices as part of their routine departure procedures.

TABLE 4.1-6
EMISSION REDUCTION STRATEGIES CURRENTLY IMPLEMENTED AT JWA

Strategy Number	Strategy Name	Implementation Status
BP-11	Support the Use of Customer Self-Service Equipment in Terminal Design	The Airport's terminal complex contains self-service kiosks at the ticket counters for all airlines, with the exception of the ticket counters for airlines providing international service (AirTran Airways and Interjet) because the passports need to be verified at the counter.
CS-02	Add Mineral Carbonation Systems to Exhaust Streams	JWA has a state-of-the-art cogeneration power plant, which uses catalysts to reduce exhaust CO to low levels (below 32 parts per million at 15% O_2). Plant operation began in 2010.
EM-04	Enter into a Green Power Purchasing Agreement	The Airport has entered into an agreement with The Gas Company to use natural gas to produce electricity. Southern California Edison's back-up power also uses up to 30% renewables. Relatedly, the State of California has adopted a 33% renewable portfolio standard for its energy supply that must be achieved b 2020.
EM-07	Evaluate Fuel Mix	The Airport utilizes more natural gas, and less diesel and gasoline, where feasible.
EM-09	Improve Insulation of Building Envelope	JWA previously installed window tinting, cool roofs, and other forms of energy efficiency-enhancing insulation.
EM-13	Install a Cool Roof	A new cool roof was installed as part of Terminal C.
EM-17	Install LED Runway and Taxiway Lighting	JWA utilizes LED lighting on the airfield that meets all applicable FAA safety standards.
EM-18	Implement a Lighting System Energy Conservation Program	The terminal complex has transitioned to LED lighting; the design of the terminal complex also optimizes the use of natural lighting through the inclusion of vaulted ceilings, skylights and windows.
EM-19	Install a Building Automation System (BAS)	JWA installed a BAS more than ten years ago.
EM-22	Integrate Thermal Storage into Heating and Cooling Systems	JWA's cogeneration power plant makes efficient use of waste heat for heating and cooling.
EM-23	Evaluate and Upgrade the Central Plant and Distribution System Equipment	JWA built an on-site cogeneration plant in 2010.
EM-25	Install Evaporative Cooling Systems	JWA installed evaporative cooling systems as part of the cogeneration power plant built in 2010.
EM-26	Install Energy Efficient Chillers	JWA's cogeneration power plant includes energy efficient chillers.

TABLE 4.1-6
EMISSION REDUCTION STRATEGIES CURRENTLY IMPLEMENTED AT JWA

Strategy Number	Strategy Name	Implementation Status
EM-28	Install a Heat Recovery System	JWA's cogeneration power plant includes a heat recovery system.
EM-30	Reduce Transmission Losses in Electrical Wires	JWA previously upgraded the electrical system to reduce transmission losses.
EM-33	Construct a Cogeneration or Trigeneration Energy System	JWA built an on-site cogeneration power plant in 2010.
EM-37	Incorporate the Use of Natural Ventilation and Economizer Control	The Airport has incorporated the use of natural ventilation and economizer control in the entire terminal complex.
GT-07	Implement "On-foot" Payment for Parking	The Airport installed "on-foot" parking payment stations in Parking Structure C; further, there is no added benefit to installing such stations in the other parking structures because the current parking system is already equipped with card swiping abilities and has reduced vehicle idling times.
GT-17	Support Alternatively Fueled Taxis	In compliance with SCAQMD Rule 1194, JWA requires that fleet vehicles, such as taxi cabs and parking shuttles, operate on clean burning compressed natural gas (CNG) or other cleaner burning fuel alternatives. The Airport's taxi provider, Orange County Yellow Cab, utilizes 100% CNG vehicles.
OM-03	Use a Computerized Maintenance Management System (CMMS)	JWA has used a CMMS since 1996.
RF-01	Replace Refrigerants with Compounds that are Natural or have Lower Global Warming Potential (GWP).	JWA has replaced refrigerants with the lowest available global warming potential (GWP) compounds. The largest quantity of refrigerants in use at JWA is at the cogeneration power plant, which utilizes lithium bromide – a refrigerant with zero GWP.
RF-02	Incorporate Intelligent Fault Diagnosis for HVAC Refrigerant Systems	JWA currently utilizes this diagnosis tool.

Notes: Strategy numbers indicate ACRP Report categories. AF: Airfield design and operations; BP: Business planning; CS: Construction; EM: Energy management; GT: Ground transportation; OM: Operations and maintenance; RF: Refrigerants

As utilized in this Table, a "regular gate" is a gate that utilizes a loading bridge and provides power and preconditioned air to aircraft. Gates 2 through 21 are regular gates. Gates 1A, B & C and 22A, B & C can only accommodate smaller regional/commuter jets, which are too small to have loading bridges and hydrant fueling. (For perspective, six regional/commuter jets fit in the space occupied by two aircraft at Gates 2-21.)

Source: *Air Quality Technical Report,* Appendix A, Table A-1, Environ 2014.

4.1.5 THRESHOLDS OF SIGNIFICANCE

In accordance with the County's Environmental Analysis Checklist and Appendix G of the State CEQA Guidelines, the Project would result in a significant impact to air quality if it would:

Threshold 4.1-1 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Threshold 4.1-2 Expose sensitive receptors to substantial pollutant concentrations.

Threshold 4.1-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).

Threshold 4.1-4 Conflict with or obstruct implementation of the applicable air quality plan.

The SCAQMD has established significance thresholds to assess the impacts of project-related operational emissions on regional and local ambient air quality as shown in Table 4.1-7.

TABLE 4.1-7
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds	
Pollutant	**Operation**
NOx	55 lbs/day
VOC	55 lbs/day
PM10	150 lbs/day
PM2.5	55 lbs/day
SOx	150 lbs/day
CO	550 lbs/day
Lead[a]	3 lbs/day
Toxic Air Contaminants	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic and Acute Hazard Index ≥ 1.0 (project increment)
Ambient Air Quality Standards for Criteria Pollutants	
NO_2 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (State) 0.03 ppm (State) and 0.0534 ppm (federal)
PM10 24-hour average annual average	 2.5 μg/m^3 (operation) 1.0 μg/m^3
PM2.5 24-hour average	 2.5 μg/m^3 (operation)
SO_2 1-hour average 24-hour average	 0.25 ppm (State) and 0.075 ppm (federal – 99th percentile) 0.04 ppm (State)

TABLE 4.1-7
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds	
Pollutant	**Operation**
Sulfate[b] 24-hour average	 25 μg/m^3 (State)
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (State) and 35 ppm (federal) 9.0 ppm (State/federal)
Lead[a] 30-day average Rolling 3-month average Quarterly average	 1.5 μg/m^3 (State) 0.15 μg/m^3 (federal) 1.5 μg/m^3 (federal)

lbs/day: pounds per day; NOx: nitrogen oxides; VOC: volatile organic compound; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SOx: sulfur oxides; CO: carbon monoxide; TAC: toxic air contaminant; SCAQMD: South Coast Air Quality Management District; NO_2: nitrogen dioxide; ppm: parts per million; μg/m3: micrograms per cubic meter; SO_2: sulfur dioxide.

[a] Note that general aviation aircraft operations are expected to decrease in the future (*Aviation Forecast Technical Report*, AECOM, 2015, provided in Appendix B). Since lead emissions are predominately attributable to general aviation aircraft, lead emissions are also expected to decrease. Therefore, the analysis does not quantitatively evaluate the lead NAAQS and CAAQS.

[b] The Project also is not expected to have meaningful sulfate emissions, which primarily are formed from sulfur dioxide emissions from power plants and industrial facilities. These emissions generally are considered a secondary particulate matter that forms in the atmosphere from gases. Therefore, the analysis also does not quantitatively evaluate the sulfate CAAQS.

Source: *Air Quality Technical Report,* Table 4-1, Environ 2014.

4.1.6 IMPACT ANALYSIS

THRESHOLD EVALUATION

Threshold 4.1-1 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Mass Daily Emissions – Criteria Air Pollutants

Operational mass emissions of VOCs, NOx, CO, SOx, PM10, and PM2.5 were estimated using the methodologies described in Section 4.1.3. In addition to the Proposed Project analysis, Alternatives A, B, and C and the No Project Alternative were analyzed. The analysis of the Proposed Project and Alternatives evaluates emission levels during three phases (Phase 1: 2016–2020, Phase 2: 2021–2025, Phase 3: 2026–2030).

Where not otherwise specified, emissions for the alternatives were based on the same data and same models as those used for the Proposed Project analysis. For aircraft, EDMS was used to calculate emissions based on alternative-specific aircraft estimates. Since the basis for other sources of emissions was similar to the Proposed Project, the MAP for each alternative was used to estimate emissions for the stationary sources, utilities, and parking. The ADD for each alternative was used to estimate emissions for GSE and JWA vehicles and equipment sources. The trip generation data was used to estimate emissions from traffic.

As shown in the following analysis, the primary sources of the operational emissions are traffic-related mobile sources and aircraft. The emissions from traffic-related mobile sources are expected to gradually decline in the future as cars become more fuel efficient due to existing regulations (i.e., Pavley Standard and the Advanced Clean Cars program). However, the criteria pollutant emissions reductions due to these regulations are not incorporated in the emissions model; therefore, the vehicle emissions forecasts are conservatively high. Similarly, the emissions from aircraft are expected to gradually decline in the future as aircraft engines become more efficient and as aircraft fuel becomes cleaner.

As discussed in Section 3.7, Analyses Assumptions, and shown in Table 3-12, Based Aircraft Forecasts, single-engine and multi-engine general aviation operations area forecasted to steadily decline from the existing conditions through Phase 3. The primary pollutants from these piston engine aircraft are CO, PM10, and PM2.5. Due to the anticipated reduction in general aviation operations, emissions of these pollutants will decline over the period of analysis. .

The quantitative reductions in GSE emissions attributable to the increased electrification of GSE equipment are shown below. The analysis incorporates the Airport's commitment to increase the percentage of electrified GSE from baseline conditions by 15 percent for Phase 1, by 35 percent for Phase 2, and 50 percent for Phase 3;

The results of the calculations for the individual sources may be found in the *Air Quality Technical Report* located in Appendix D (see Table 3.1-6 for Aircraft; Table 3.1-8 for APUs; Table 3.1-10 for GSE; Table 3.1-13 for parking lots; Table 3.1-15 for terminal traffic; Table 3.1-16b for JWA-owned vehicles; Table 3.1-17b for JWA-owned airside equipment; and Tables 3.1-18 and 3.1-21 for stationary sources).

Proposed Project

The calculated daily CAP emissions for the Proposed Project operations are summarized in Table 4.1-8. The values are incremental changes relative to the Baseline conditions.

TABLE 4.1-8
PROPOSED PROJECT CRITERIA POLLUTANT EMISSIONS

Source	Project Emissions (lbs/day)																	
	VOC			**NOx**			**CO**			**SOx**			**PM10**			**PM2.5**		
	Phase 1	**Phase 2**	**Phase 3**	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 1**	**Phase 2**	**Phase 3**
Aircraft	15.8	40.9	57.1	408.1	619.4	763.0	-2,492	-3,854	-5,141	40.6	60.5	75.2	-1.6	-2.1	-3.3	-1.6	-2.1	-3.3
GSE	-11.8	-21.0	-25.7	-49.2	-99.0	-121.8	-365.2	-644.9	-721.2	-0.6	-1.2	-1.6	-1.2	-2.9	-3.9	-1.2	-2.8	-3.7
APUs	0.4	0.7	1.0	7.3	13.1	17.0	4.1	8.1	11.6	1.0	1.8	2.4	0.8	1.4	1.9	0.8	1.4	1.9
Airside	0.2	0.5	0.5	0.2	0.6	0.6	1.0	3.1	3.1	0.03	0.1	0.1	0.01	0.03	0.03	0.01	0.03	0.03
Traffic	31.7	38.4	42.1	93.4	100.5	100.5	420.5	488.5	522.2	1.1	1.8	2.3	82.7	132.6	168.0	22.9	36.5	46.3
Parking Lots	-0.5	6.5	34.2	-1.5	-3.5	-2.4	-16.0	-31.2	-24.7	0.01	0.03	0.07	-0.03	0.1	0.4	-0.05	0.03	0.2
Stationary Sources	0.9	1.4	1.8	0.6	1.2	1.3	3.7	6.1	7.7	0.03	0.05	0.06	0.5	0.9	1.1	0.5	0.9	1.1
Total	37	**68**	**111**	**459**	**632**	**758**	-2,444	-4,025	-5,343	42	63	78	81	130	**164**	21	34	43
SCAQMD Maximum Significance Threshold	55	55	55	55	55	55	550	550	550	150	150	150	150	150	150	55	55	55
Significant?	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No	No	No	**Yes**	No	No	No

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units; SCAQMD: South Coast Air Quality Management District.

Bold indicates exceedance of the SCAQMD threshold.

Note: Negative emissions indicate a decrease from the Baseline condition. These decreases are primarily due to reduction in general aviation, increase in electrified GSE, and improved vehicle emission standards.

Source: *Air Quality Technical Report;* Tables 5.2-1, 5.2-3, 5.2-5; Environ 2014.

Phase 1

CAP emissions from implementation of Phase 1 of the Proposed Project would exceed the SCAQMD mass daily significance NOx threshold.

Phase 2

CAP emissions from implementation of Phase 2 of the Proposed Project would exceed the SCAQMD mass daily significance VOC and NOx thresholds.

Phase 3

CAP emissions from implementation of Phase 3 of the Proposed Project would exceed the SCAQMD mass daily significance VOC, NOx, and PM10 thresholds.

Impact Conclusion: *The Proposed Project's operational emissions would have significant operational mass emissions impacts for all phases.*

Alternative A

The calculated daily CAP emissions for Alternative A operations are summarized in Table 4.1-9. The values are incremental changes relative to the Baseline conditions.

TABLE 4.1-9
ALTERNATIVE A CRITERIA POLLUTANT EMISSIONS

Source	Alternative A Emissions (lbs/day)																	
	VOC			NOx			CO			SOx			PM10			PM2.5		
	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Aircraft	17.4	30.3	69.3	426.7	561.5	856.3	-2,531.5	-3,969.7	-5,160.3	38.0	48.9	77.1	-1.4	-3.0	-2.1	-1.4	-3.0	-2.1
GSE	-12.5	-21.7	-24.1	-52.3	-101.7	-117.9	-378.3	-651.4	-717.1	-0.7	-1.3	-1.6	-1.4	-3.0	-3.7	-1.3	-2.9	-3.6
APUs	0.3	0.4	0.8	8.2	12.1	20.3	2.6	4.8	10.0	0.9	1.4	2.4	0.7	1.0	1.8	0.7	1.0	1.8
Airside	0.8	1.2	1.7	1.1	1.6	2.2	5.6	8.2	11.3	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1
Traffic	31.4	32.2	45.5	92.5	84.4	108.7	416.3	410.3	564.5	1.1	1.5	2.5	81.8	111.4	181.6	22.7	30.7	50.1
Parking Lots	-0.5	1.9	38.1	-1.5	-4.0	-2.0	-16.0	-35.0	-21.9	0.0	0.0	0.1	0.0	0.1	0.4	0.0	0.0	0.2
Stationary Sources	1.0	1.4	2.2	1.5	2.3	3.2	4.1	5.6	9.0	0.0	0.0	0.1	0.8	1.1	1.7	0.8	1.1	1.7
Total	**38**	**46**	**134**	**476**	**556**	**871**	-2,497	-4,227	-5,304	40	51	81	80	108	**180**	21	27	48
SCAQMD Maximum Significance Threshold	55	55	55	55	55	55	550	550	550	150	150	150	150	150	150	55	55	55
Significant?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No	No	No	**Yes**	No	No	No

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units; SCAQMD: South Coast Air Quality Management District.

Note: Negative emissions indicate a decrease from the Baseline condition. These decreases are primarily due to reduction in general aviation, increase in electrified GSE, and improved vehicle emission standards.

Source: *Air Quality Technical Report,* Table 5.2-7a, Environ 2014.

Phase 1

CAP emissions from implementation of Phase 1 of Alternative A would exceed the SCAQMD mass daily significance NOx threshold.

Phase 2

CAP emissions from implementation of Phase 2 of Alternative A would exceed the SCAQMD mass daily significance NOx threshold.

Phase 3

CAP emissions from implementation of Phase 3 of Alternative A would exceed the SCAQMD mass daily significance VOC, NOx, and PM10 thresholds.

Impact Conclusion: *Alternative A's operational emissions would have significant operational mass emissions impacts for all phases.*

Alternative B

The calculated daily CAP emissions for Alternative B operations are summarized in Table 4.1-10. The values are incremental changes relative to the Baseline conditions.

TABLE 4.1-10
ALTERNATIVE B CRITERIA POLLUTANT EMISSIONS

Source	Alternative B Emissions (lbs/day)																	
	VOC			NOx			CO			SOx			PM10			PM2.5		
	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Aircraft	16.8	79.2	136.0	420.8	869.5	1,274.4	-2,518.9	-3,670.0	-4,737.2	38.9	85.1	127.6	-1.5	1.5	4.1	-1.5	1.5	4.1
GSE	-12.3	-20.2	-24.8	-51.3	-96.4	-119.7	-374.1	-639.5	-718.5	-0.6	-1.2	-1.6	-1.3	-2.8	-3.8	-1.3	-2.7	-3.6
APUs	0.3	1.0	1.7	7.9	20.2	31.2	3.1	11.8	20.0	0.9	2.7	4.3	0.7	2.1	3.4	0.7	2.1	3.4
Airside	0.6	0.9	1.1	0.8	1.2	1.4	4.1	6.2	7.2	0.1	-0.6	0.2	0.0	0.1	0.1	0.0	0.1	0.1
Traffic[1]	31.5	55.7	73.5	92.7	145.7	175.6	417.2	708.4	912.2	1.1	2.7	4.1	82.0	192.3	293.5	22.7	53.0	81.0
Parking Lots	-0.5	20.5	67.1	-1.5	-1.8	1.0	-16.0	-19.7	-0.8	0.0	0.0	0.1	0.0	0.2	0.6	0.0	0.1	0.4
Stationary Sources	0.9	2.1	3.1	1.2	2.1	2.7	4.0	9.0	13.3	0.0	0.1	0.1	0.7	1.4	2.0	0.7	1.4	2.0
Total	37	**139**	**258**	**470**	**940**	**1,367**	-2,481	-3,594	-4,504	40	89	135	81	**195**	**300**	21	**55**	**87**
SCAQMD Maximum Significance Threshold	55	55	55	55	55	55	550	550	550	150	150	150	150	150	150	55	55	55
Significant?	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No	No	**Yes**	**Yes**	No	**Yes**	**Yes**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units; SCAQMD: South Coast Air Quality Management District.

Note: Negative emissions indicate a decrease from the Baseline condition. These decreases are primarily due to reduction in general aviation, increase in electrified GSE, and improved vehicle emission standards.

Source: *Air Quality Technical Report,* Table 5.2-8a, Environ 2014.

Phase 1

CAP emissions from implementation of Phase 1 of Alternative B would exceed the SCAQMD mass daily significance NOx threshold.

Phase 2

CAP emissions from implementation of Phase 2 of Alternative B would exceed the SCAQMD mass daily significance VOC, NOx, PM10, and PM2.5 thresholds.

Phase 3

CAP emissions from implementation of Phase 3 of Alternative B would exceed the SCAQMD mass daily significance VOC, NOx, PM10, and PM2.5 thresholds.

Impact Conclusion: *Alternative B's operational emissions would have significant operational mass emissions impacts for all phases.*

Alternative C

The calculated daily CAP emissions for Alternative C operations are summarized in Table 4.1-11. The values are incremental changes relative to the Baseline conditions.

TABLE 4.1-11
ALTERNATIVE C CRITERIA POLLUTANT EMISSIONS

Source	Alternative C Emissions (lbs/day)																	
	VOC			NOx			CO			SOx			PM10			PM2.5		
	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3	Phase 1	Phase 2	Phase 3
Aircraft	282.8	276.2	270.7	2,117.9	2,123.0	2,128.1	-1,347.7	-2,868.2	-4,278.5	197.4	196.6	195.9	22.8	19.4	16.2	22.8	19.4	16.2
GSE	-4.7	-20.2	-20.6	-12.0	-96.4	-109.1	-247.5	-639.5	-708.3	0.0	-1.2	-1.5	0.2	-2.8	-3.3	0.2	-2.7	-3.2
APUs	2.5	2.5	2.5	58.7	58.8	58.1	27.6	28.4	28.7	7.2	7.2	7.1	5.4	5.4	5.4	5.4	5.4	5.4
Airside	4.6	4.6	4.6	5.8	5.8	5.8	30.5	30.5	30.5	1.0	-0.6	1.0	0.3	0.3	0.3	0.3	0.3	0.3
Traffic[1]	150.0	112.9	97.8	441.5	295.5	233.5	1,987.7	1,436.2	1,212.9	5.3	5.4	5.4	390.7	389.9	390.3	108.2	107.4	107.6
Parking Lots	73.0	65.8	92.1	8.8	3.6	3.7	56.6	17.7	17.4	0.1	0.1	0.1	0.3	0.4	0.8	0.2	0.2	1.1
Stationary Sources	3.7	3.7	3.7	7.8	7.8	7.8	6.1	15.1	15.1	0.1	0.1	0.1	3.4	3.4	3.4	3.4	3.4	3.4
Total	**512**	**445**	**451**	**2,629**	**2,398**	**2,328**	513	-1,980	-3,682	**211**	**208**	**208**	**423**	**416**	**413**	**140**	**133**	**131**
SCAQMD Maximum Significance Threshold	55	55	55	55	55	55	550	550	550	150	150	150	150	150	150	55	55	55
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units; SCAQMD: South Coast Air Quality Management District.

Note: Negative emissions indicate a decrease from the Baseline condition. These decreases are primarily due to reduction in general aviation, increase in electrified GSE, and improved vehicle emission standards.

Source: *Air Quality Technical Report,* Table 5.2-9a, Environ 2014.

Phase 1

CAP emissions from implementation of Phase 1 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds.

Phase 2

CAP emissions from implementation of Phase 2 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds.

Phase 3

CAP emissions from implementation of Phase 3 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds.

Impact Conclusion: *Alternative C's operational emissions would have significant operational mass emissions impacts for all phases.*

No Project Alternative

The calculated daily CAP emissions for the No Project Alternative operations are summarized in Table 4.1-12. The values are incremental changes relative to the Baseline conditions.

TABLE 4.1-12
NO PROJECT ALTERNATIVE CRITERIA POLLUTANT EMISSIONS

Source	No Project Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Aircraft	15.8	408.1	-2,492	40.6	-1.6	-1.6
GSE	-11.8	-49.2	-365.2	-0.6	-1.2	-1.2
APUs	0.4	7.3	4.1	1.0	0.8	0.8
Airside	0.2	0.2	1.0	0.03	0.01	0.01
Traffic	31.7	93.4	420.5	1.1	82.7	22.9
Parking Lots	-0.5	-1.5	-16.0	0.01	-0.03	-0.05
Stationary Sources	0.9	0.6	3.7	0.03	0.5	0.5
Total	36.7	**458.8**	-2,444	42.2	81.1	21.4
SCAQMD Maximum Significance Threshold	55	55	550	150	150	55
Significant?	No	**Yes**	No	No	No	No

lbs/day: pound/day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; GSE: ground support equipment; APUs: auxiliary power units; SCAQMD: South Coast Air Quality Management District.

Note: Negative emissions indicate a decrease from the Baseline condition. These decreases are primarily due to reduction in general aviation, increase in electrified GSE, and improved vehicle emission standards.

Source: *Air Quality Technical Report,* Table 5.2-10a, Environ 2014.

As shown in Table 4.1-12, CAP emissions from implementation of the No Project Alternative would exceed the SCAQMD mass daily significance NOx threshold.

Impact Conclusion: *The No Project's Alternative operational emissions would have significant operational mass emissions impacts.*

Ambient Air Quality Standards

Air dispersion modeling of CAPs was performed as described in Section 4.1.3. The results of the modeling are compared with the SCAQMD air quality significance thresholds (Table 4.1-7) and the CAAQS and NAAQS (Table 4.1-1).

The ambient air quality estimates presented below are based on conservative emission estimates. For example, the air dispersion modeling results are based on the combination of maximum emissions that may occur with the maximum environmental impactmeteorological conditions. While it is possible that the calculated ambient air quality concentrations may occur, these are conservatively high estimates and thus they may never occur. Further, the modeling analysis conservatively assumes that general aviation operations remain static (i.e., equivalent to the Baseline condition). If general aviation was included in the air dispersion modeling analysis, the Project impacts would be lower than that estimated due to the resulting decrease in emissions related to general aviation aircraft operations.

Proposed Project

The ambient air quality results from Project operational emissions are summarized in Tables 4.1-13 and 4.1-14.

TABLE 4.1-13
PROPOSED PROJECT CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	**Averaging Time**	**Maximum Impact from Proposed Project Emissions (µg/m³)**	**Background Pollutant Concentration (µg/m³)**	**Maximum Proposed Project + Background Concentration (µg/m³)**	**SCAQMD CEQA Threshold (µg/m³)**	**Maximum Proposed Project + Background > SCAQMD?**
Phase 1	NO_2	1 hour	229	139	368	339	**Yes**
		Annual	3	21	25	57	No
	SO_2	1 hour	36	26	62	655	No
		24 hour	3	5	9	105	No
	PM10	24 hour	2.9	N/A	N/A	2.5	**Yes**
		Annual	1.2	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	1.1	N/A	N/A	2.5	No
Phase 2	NO_2	1 hour	356	139	496	339	**Yes**
		Annual	5	21	26	57	No
	SO_2	1 hour	54	26	80	655	No
		24 hour	5	5	10	105	No
	PM10	24 hour	4.6	N/A	N/A	2.5	**Yes**
		Annual	1.9	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	1.8	N/A	N/A	2.5	No

TABLE 4.1-13
PROPOSED PROJECT CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Proposed Project Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Proposed Project + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Proposed Project + Background > SCAQMD?
Phase 3	NO_2	1 hour	432	139	571	339	**Yes**
		Annual	6	21	27	57	No
	SO_2	1 hour	67	26	93	655	No
		24 hour	6	5	12	105	No
	PM10	24 hour	5.9	N/A	N/A	2.5	**Yes**
		Annual	2.4	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	2.3	N/A	N/A	2.5	No

μg/m³: micrograms per cubic meter; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; the SCAQMD thresholds for 24-hour and annual PM10 and 24-hour PM2.5 emissions are based on the project incremental emissions and do not consider background concentrations.

Source: *Air Quality Technical Report,* Table 5.3-1a, Environ 2014.

TABLE 4.1-14
PROPOSED PROJECT CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Proposed Project Emissions (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Proposed Project + Background Concentration (µg/m³)	CAAQS (µg/m³)	Maximum Proposed Project > CAAQS?	NAAQS (µg/m³)	Maximum Proposed Project > NAAQS?
Phase 1	NO_2	1 hour (98th percentile, averaged over 3 years)	149	105	254	N/A	N/A	188	**Yes**
		1 hour	229	139	368	339	**Yes**	N/A	N/A
		Annual	3	21	25	57	No	100	No
	SO_2	1 hour	36	26	62	655	No	196	No
		24 hour	3	5	9	105	No	N/A	N/A
	PM10	24 hour	2.9	53	55.9	50	**Yes**	150	No
		Annual	1.2	24.8	26.0	20	**Yes**	N/A	N/A
	PM2.5	24 hour	1.1	28	29.1	N/A	N/A	35	No
		Annual	0.4	11	11.4	12	No	12	No
Phase 2	NO_2	1 hour (98th percentile, averaged over 3 years)	232	105	337	N/A	N/A	188	**Yes**
		1 hour	356	139	496	339	**Yes**	N/A	N/A
		Annual	5	21	26	57	No	100	No
	SO_2	1 hour	54	26	80	655	No	196	No
		24 hour	5	5	10	105	No	N/A	N/A
	PM10	24 hour	4.6	53	57.6	50	**Yes**	150	No
		Annual	1.9	24.8	26.7	20	**Yes**	N/A	N/A
	PM2.5	24 hour	1.8	28	29.8	N/A	N/A	35	No
		Annual	0.6	11	11.6	12	No	12	No

TABLE 4.1-14
PROPOSED PROJECT CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Proposed Project Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Proposed Project + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum Proposed Project > CAAQS?	NAAQS (μg/m³)	Maximum Proposed Project > NAAQS?
Phase 3	NO_2	1 hour (98th percentile, averaged over 3 years)	281	105	387	N/A	N/A	188	**Yes**
		1 hour	432	139	571	339	**Yes**	N/A	N/A
		Annual	6	21	27	57	No	100	No
	SO_2	1 hour	67	26	93	655	No	196	No
		24 hour	6	5	12	105	No	N/A	N/A
	PM10	24 hour	5.9	53	58.9	50	**Yes**	150	No
		Annual	2.4	24.8	27.2	20	**Yes**	N/A	N/A
	PM2.5	24 hour	2.3	28	30.3	N/A	N/A	35	No
		Annual	0.8	11	11.8	12	No	12	No

μg/m³: micrograms per cubic meter; CAAQS: California Ambient Air Quality Standards; NAAQS: National Ambient Air Quality Standards; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; there are no CAAQS for 1-hour NO_2 averaged over 3 years or 24-hour PM2.5 concentrations; the 1-hour NAAQS is evaluated on the 3-year average; there is no NAAQS for annual PM10 concentrations.

Source: *Air Quality Technical Report,* Table 5.3-1b, Environ 2014.

Phase 1

Implementation of Phase 1 of the Proposed Project would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 2

Implementation of Phase 2 of the Proposed Project would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 3

Implementation of Phase 3 of the Proposed Project would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Impact Conclusion: *The Proposed Project would have a significant impact on local ambient air quality concentrations.*

Alternative A

The ambient air quality results from Alternative A operational emissions are summarized in Tables 4.1-15 and 4.1-16.

TABLE 4.1-15
ALTERNATIVE A CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative A Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative A + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Alternative A + Background > SCAQMD?
Phase 1	NO_2	1 hour	570	139	709	339	**Yes**
		Annual	8	21	29	57	No
	SO_2	1 hour	85	26	111	655	No
		24 hour	8	5	13	105	No
	PM10	24 hour	3.1	N/A	N/A	2.5	**Yes**
		Annual	1.2	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	1.4	N/A	N/A	2.5	No
		Annual	0.4	11	11	N/A	N/A
Phase 2	NO_2	1 hour	731	139	871	339	**Yes**
		Annual	10	21	32	57	No
	SO_2	1 hour	108	26	134	655	No
		24 hour	10	5	15	105	No
	PM10	24 hour	4.2	N/A	N/A	2.5	**Yes**
		Annual	1.7	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	1.8	N/A	N/A	2.5	No
		Annual	0.6	11	11.6	N/A	N/A

TABLE 4.1-15
ALTERNATIVE A CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative A Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative A + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Alternative A + Background > SCAQMD?
Phase 3	NO_2	1 hour	1069	139	1208	339	**Yes**
		Annual	15	21	36	57	No
	SO_2	1 hour	159	26	185	655	No
		24 hour	15	5	20	105	No
	PM10	24 hour	6.8	N/A	N/A	2.5	**Yes**
		Annual	2.7	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	2.9	N/A	N/A	2.5	**Yes**
		Annual	0.9	11	11.9	N/A	N/A

μg/m³: micrograms per cubic meter; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; N/A: not applicable; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Source: *Air Quality Technical Report,* Table 5.3-2a, Environ 2014.

TABLE 4.1-16
ALTERNATIVE A CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Alternative A Emissions (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Alternative A + Background Concentration (µg/m³)	CAAQS (µg/m³)	Maximum Alternative A > CAAQS?	NAAQS (µg/m³)	Maximum Alternative A > NAAQS?
Phase 1	NO_2	1 hour (98th percentile, averaged over 3 years)	369	105	474	N/A	N/A	188	**Yes**
		1 hour	570	139	709	339	**Yes**	N/A	N/A
		Annual	8	21	29	57	No	100	No
	SO_2	1 hour	85	26	111	655	No	196	No
		24 hour	8	5	13	105	No	N/A	N/A
	PM10	24 hour	3.1	53	56.1	50	**Yes**	150	No
		Annual	1.2	24.8	26.0	20	**Yes**	N/A	N/A
	PM2.5	24 hour	1.4	28	29.4	N/A	N/A	35	No
		Annual	0.4	11	11.4	12	No	12	No
Phase 2	NO_2	1 hour (98th percentile, averaged over 3 years)	473	105	579	N/A	N/A	188	**Yes**
		1 hour	731	139	871	339	**Yes**	N/A	N/A
		Annual	10	21	32	57	No	100	No
	SO_2	1 hour	108	26	134	655	No	196	No
		24 hour	10	5	15	105	No	N/A	N/A
	PM10	24 hour	4.2	53	57.2	50	**Yes**	150	No
		Annual	1.7	24.8	26.5	20	**Yes**	N/A	N/A
	PM2.5	24 hour	1.8	28	29.8	N/A	N/A	35	No
		Annual	0.6	11	11.6	12	No	12	No

TABLE 4.1-16
ALTERNATIVE A CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Alternative A Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative A + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum Alternative A > CAAQS?	NAAQS (μg/m³)	Maximum Alternative A > NAAQS?
Phase 3	NO_2	1 hour (98th percentile, averaged over 3 years)	693	105	798	N/A	N/A	188	**Yes**
		1 hour	1,069	139	1,208	339	**Yes**	N/A	N/A
		Annual	15	21	36	57	No	100	No
	SO_2	1 hour	159	26	185	655	No	196	No
		24 hour	15	5	20	105	No	N/A	N/A
	PM10	24 hour	6.8	53	59.8	50	**Yes**	150	No
		Annual	2.7	24.8	27.5	20	**Yes**	N/A	N/A
	PM2.5	24 hour	2.9	28	30.9	N/A	N/A	35	No
		Annual	0.9	11	11.9	12	No	12	No

μg/m³: micrograms per cubic meter; CAAQS: California Ambient Air Quality Standards; NAAQS: National Ambient Air Quality Standards; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; the SCAQMD thresholds for 24-hour and annual PM10 and 24-hour PM2.5 emissions are based on the project incremental emissions and do not consider background concentrations.

Source: *Air Quality Technical Report,* Table 5.3-2b, Environ 2014.

Phase 1

Implementation of Phase 1 of Alternative A would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 2

Implementation of Phase 2 of Alternative A would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 3

Implementation of Phase 3 of Alternative A would result in exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Impact Conclusion: *Alternative A would have a significant impact on local ambient air quality concentrations.*

Alternative B

The ambient air quality results from Alternative B operational emissions are summarized in Tables 4.1-17 and 4.1-18.

TABLE 4.1-17
ALTERNATIVE B CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative B Emissions (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Alternative B + Background Concentration (µg/m³)	SCAQMD CEQA Threshold (µg/m³)	Maximum Alternative B + Background > SCAQMD?
Phase 1	NO_2	1 hour	461	139	601	339	**Yes**
		Annual	7	21	28	57	No
	SO_2	1 hour	70	26	96	655	No
		24 hour	7	5	12	105	No
	PM10	24 hour	3.0	N/A	N/A	2.5	**Yes**
		Annual	1.2	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	1.3	N/A	N/A	2.5	No
		Annual	0.4	11	11	N/A	N/A
Phase 2	NO_2	1 hour	593	139	732	339	**Yes**
		Annual	9	21	30	57	No
	SO_2	1 hour	89	26	115	655	No
		24 hour	8	5	14	105	No
	PM10	24 hour	6.8	N/A	N/A	2.5	**Yes**
		Annual	2.7	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	2.6	N/A	N/A	2.5	**Yes**
		Annual	0.9	11	11.9	N/A	N/A

TABLE 4.1-17
ALTERNATIVE B CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative B Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative B + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Alternative B + Background > SCAQMD?
Phase 3	NO_2	1 hour	769	139	908	339	**Yes**
		Annual	11	21	32	57	No
	SO_2	1 hour	116	26	143	655	No
		24 hour	11	5	16	105	No
	PM10	24 hour	10.2	N/A	N/A	2.5	**Yes**
		Annual	4.2	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	3.9	N/A	N/A	2.5	**Yes**
		Annual	1.3	11	12.3	N/A	N/A

μg/m³: micrograms per cubic meter; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; N/A: not applicable; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Source: *Air Quality Technical Report,* Table 5.3-3a, Environ 2014.

TABLE 4.1-18
ALTERNATIVE B CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Alternative B Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative B + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum Alternative B > CAAQS?	NAAQS (μg/m³)	Maximum Alternative B > NAAQS?
Phase 1	NO_2	1 hour (98th percentile, averaged over 3 years)	299	105	404	N/A	N/A	188	**Yes**
		1 hour	461	139	601	339	**Yes**	N/A	N/A
		Annual	7	21	28	57	No	100	No
	SO_2	1 hour	70	26	96	655	No	196	No
		24 hour	7	5	12	105	No	N/A	N/A
	PM10	24 hour	3.0	53	56.0	50	**Yes**	150	No
		Annual	1.2	24.8	26.0	20	**Yes**	N/A	N/A
	PM2.5	24 hour	1.3	28	29.3	N/A	N/A	35	No
		Annual	0.4	11	11.4	12	No	12	No
Phase 2	NO_2	1 hour (98th percentile, averaged over 3 years)	385	105	490	N/A	N/A	188	**Yes**
		1 hour	593	139	732	339	**Yes**	N/A	N/A
		Annual	9	21	30	57	No	100	No
	SO_2	1 hour	89	26	115	655	No	196	No
		24 hour	8	5	14	105	No	N/A	N/A
	PM10	24 hour	6.8	53	59.8	50	**Yes**	150	No
		Annual	2.7	24.8	27.5	20	**Yes**	N/A	N/A
	PM2.5	24 hour	2.6	28	30.6	N/A	N/A	35	No
		Annual	0.9	11	11.9	12	No	12	No

TABLE 4.1-18
ALTERNATIVE B CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Alternative B Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative B + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum Alternative B > CAAQS?	NAAQS (μg/m³)	Maximum Alternative B > NAAQS?
Phase 3	NO_2	1 hour (98th percentile, averaged over 3 years)	500	105	606	N/A	N/A	188	**Yes**
		1 hour	769	139	908	339	**Yes**	N/A	N/A
		Annual	11	21	32	57	No	100	No
	SO_2	1 hour	116	26	143	655	No	196	No
		24 hour	11	5	16	105	No	N/A	N/A
	PM10	24 hour	10.2	53	63.2	50	**Yes**	150	No
		Annual	4.2	24.8	29.0	20	**Yes**	N/A	N/A
	PM2.5	24 hour	3.9	28	31.9	N/A	N/A	35	No
		Annual	1.3	11	12.3	12	**Yes**	12	**Yes**

μg/m³: micrograms per cubic meter; CAAQS: California Ambient Air Quality Standards; NAAQS: National Ambient Air Quality Standards; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; the SCAQMD thresholds for 24-hour and annual PM10 and 24-hour PM2.5 emissions are based on the project incremental emissions and do not consider background concentrations.

Source: *Air Quality Technical Report,* Table 5.3-3b, Environ 2014.

Phase 1

Implementation of Phase 1 of Alternative B would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 2

Implementation of Phase 2 of Alternative B would result in exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Phase 3

Implementation of Phase 3 of Alternative B would result in exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, PM 10 annual, and PM2.5 annual CAAQS; and exceedance of the NO_2 1-hour and PM2.5 annual NAAQS.

Impact Conclusion: *Alternative B would have a significant impact on local ambient air quality concentrations.*

Alternative C

The ambient air quality results from Alternative C operational emissions are summarized in Tables 4.1-19 and 4.1-20.

TABLE 4.1-19
ALTERNATIVE C CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative C Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative C + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Alternative C + Background > SCAQMD?
Phase 1	NO_2	1 hour	2,512	139	2,651	339	**Yes**
		Annual	36	21	57	57	No
	SO_2	1 hour	368	26	394	655	No
		24 hour	35	5	40	105	No
	PM10	24 hour	14.6	N/A	N/A	2.5	**Yes**
		Annual	5.8	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	5.9	N/A	N/A	2.5	**Yes**
		Annual	2.0	11	13	N/A	N/A
Phase 2	NO_2	1 hour	2,426	139	2,565	339	**Yes**
		Annual	35	21	56	57	No
	SO_2	1 hour	354	26	380	655	No
		24 hour	34	5	39	105	No
	PM10	24 hour	14.5	N/A	N/A	2.5	**Yes**
		Annual	5.8	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	6.2	N/A	N/A	2.5	**Yes**
		Annual	2.0	11	13	N/A	N/A

TABLE 4.1-19
ALTERNATIVE C CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

	Pollutant	Averaging Time	Maximum Impact from Alternative C Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Alternative C + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum Alternative C + Background > SCAQMD?
Phase 3	NO_2	1 hour	2,593	139	2,733	339	**Yes**
		Annual	37	21	58	57	**Yes**
	SO_2	1 hour	382	26	408	655	No
		24 hour	36	5	41	105	No
	PM10	24 hour	14.7	N/A	N/A	2.5	**Yes**
		Annual	5.8	N/A	N/A	1.0	**Yes**
	PM2.5	24 hour	6.3	N/A	N/A	2.5	**Yes**
		Annual	2.1	11	13	N/A	N/A

μg/m³: micrograms per cubic meter; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; N/A: not applicable; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Source: *Air Quality Technical Report,* Table 5.3-4a, Environ 2014.

TABLE 4.1-20
ALTERNATIVE C CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Project Emissions (µg/m³)	Background Pollutant Concentration (µg/m³)	Maximum Project + Background Concentration (µg/m³)	CAAQS (µg/m³)	Maximum Alternative C > CAAQS?	NAAQS (µg/m³)	Maximum Alternative C > NAAQS?
Phase 1	NO_2	1 hour (98th percentile, averaged over 3 years)	1,628	105	1,733	N/A	N/A	188	**Yes**
		1 hour	2,512	139	2,651	339	**Yes**	N/A	N/A
		Annual	36	21	57	57	No	100	No
	SO_2	1 hour	368	26	394	655	No	196	**Yes**
		24 hour	35	5	40	105	No	N/A	N/A
	PM10	24 hour	14.6	53	67.6	50	**Yes**	150	No
		Annual	5.8	24.8	30.6	20	**Yes**	N/A	N/A
	PM2.5	24-hour	5.9	28	33.9	N/A	N/A	35	No
		Annual	2.0	11	13.0	12	**Yes**	12	**Yes**
Phase 2	NO_2	1 hour (98th percentile, averaged over 3 years)	1,572	105	1,678	N/A	N/A	188	**Yes**
		1 hour	2,426	139	2,565	339	**Yes**	N/A	N/A
		Annual	35	21	56	57	No	100	No
	SO_2	1 hour	354	26	380	655	No	196	**Yes**
		24 hour	34	5	39	105	No	N/A	N/A
	PM10	24 hour	14.5	53	67.5	50	**Yes**	150	No
		Annual	5.8	24.8	30.6	20	**Yes**	N/A	N/A
	PM2.5	24 hour	6.2	28	34.2	N/A	N/A	35	No
		Annual	2.0	11	13.0	12	**Yes**	12	**Yes**

TABLE 4.1-20
ALTERNATIVE C CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

	Pollutant	Averaging Time	Maximum Impact from Project Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum Project + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum Alternative C > CAAQS?	NAAQS (μg/m³)	Maximum Alternative C > NAAQS?
Phase 3	NO_2	1 hour (98th percentile, averaged over 3 years)	1,680	105	1,786	N/A	N/A	188	**Yes**
		1 hour	2,593	139	2,733	339	**Yes**	N/A	N/A
		Annual	37	21	58	57	**Yes**	100	No
	SO_2	1 hour	382	26	408	655	No	196	**Yes**
		24 hour	36	5	41	105	No	N/A	N/A
	PM10	24 hour	14.7	53	67.7	50	**Yes**	150	No
		Annual	5.8	24.8	30.6	20	**Yes**	N/A	N/A
	PM2.5	24 hour	6.3	28	34.3	N/A	N/A	35	No
		Annual	2.1	11	13.1	12	**Yes**	12	**Yes**

μg/m³: micrograms per cubic meter; CAAQS: California Ambient Air Quality Standards; NAAQS: National Ambient Air Quality Standards; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; the SCAQMD thresholds for 24-hour and annual PM10 and 24-hour PM2.5 emissions are based on the project incremental emissions and do not consider background concentrations.

Source: *Air Quality Technical Report,* Table 5.3-4b, Environ 2014.

Phase 1

Implementation of Phase 1 of Alternative C would result in exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS; and exceedance of the NO_2 1-hour, SO_2 1-hour, and PM2.5 annual NAAQS.

Phase 2

Implementation of Phase 2 of Alternative C would result in exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS; and exceedance of the NO_2 1-hour, SO_2 1-hour, and PM2.5 annual NAAQS.

Phase 3

Implementation of Phase 3 of Alternative C would result in exceedance of the NO_2 1-hour, NO_2 annual, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS; and exceedance of the NO_2 1-hour, SO_2 1-hour, and PM2.5 annual NAAQS.

Impact Conclusion: *Alternative C would have a significant impact on local ambient air quality concentrations.*

No Project Alternative

The ambient air quality results from the No Project Alternative operational emissions are summarized in Tables 4.1-21 and 4.1-22.

Implementation of the No Project Alternative would result in exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD thresholds; exceedance of the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS; and exceedance of the NO_2 1-hour NAAQS.

Impact Conclusion: *The No Project Alternative would have a significant impact on local ambient air quality concentrations.*

TABLE 4.1-21
NO PROJECT ALTERNATIVE CRITERIA POLLUTANT CONCENTRATIONS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

Pollutant	Averaging Time	Maximum Impact from No Project Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum No Project + Background Concentration (μg/m³)	SCAQMD CEQA Threshold (μg/m³)	Maximum No Project + Background > SCAQMD?
NO_2	1 hour	229	139	368	339	**Yes**
	Annual	3	21	25	57	No
SO_2	1 hour	36	26	62	655	No
	24 hour	3	5	9	105	No
PM10	24 hour	2.9	N/A	N/A	2.5	**Yes**
	Annual	1.2	N/A	N/A	1.0	**Yes**
PM2.5	24 hour	1.1	N/A	N/A	2.5	No
	Annual	0.4	11	11	N/A	N/A

μg/m³: micrograms per cubic meter; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; N/A: not applicable; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Source: *Air Quality Technical Report,* Table 5.3-5a, Environ 2014.

TABLE 4.1-22
NO PROJECT ALTERNATIVE CRITERIA POLLUTANT CONCENTRATIONS – CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Maximum Impact from No Project Emissions (μg/m³)	Background Pollutant Concentration (μg/m³)	Maximum No Project + Background Concentration (μg/m³)	CAAQS (μg/m³)	Maximum No Project > CAAQS?	NAAQS (μg/m³)	Maximum No Project > NAAQS?
NO_2	1 hour (98th percentile, averaged over 3 years)	149	105	254	N/A	N/A	188	**Yes**
	1 hour	229	139	368	339	**Yes**	N/A	N/A
	Annual	3	21	25	57	No	100	No
SO_2	1 hour	36	26	62	655	No	196	No
	24 hour	3	5	9	105	No	N/A	N/A
PM10	24 hour	2.9	53	56	50	**Yes**	150	No
	Annual	1.2	25	26	20	**Yes**	N/A	N/A
PM2.5	24 hour	1.1	28	29	N/A	N/A	35	No
	Annual	0.4	11	11	12	No	12	No

μg/m³: micrograms per cubic meter; CAAQS: California Ambient Air Quality Standards; NAAQS: National Ambient Air Quality Standards; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

N/A: not applicable; the SCAQMD thresholds for 24-hour and annual PM10 and 24-hour PM2.5 emissions are based on the project incremental emissions and do not consider background concentrations.

Source: *Air Quality Technical Report,* Table 5.3-5b, Environ 2014.

Local Carbon Monoxide Hotspots

Based on the discussion below, a detailed CO "hot spots" analysis is not needed to determine whether the change in the level of service ("LOS") of an intersection attributable to the Project would have the potential to result in exceedances of the CAAQS or NAAQS.

The analysis prepared for CO attainment in the SoCAB by the SCAQMD is used to evaluate the potential for CO exceedances. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 AQMP. A CO hot spot analysis was conducted for four busy intersections in Los Angeles at the peak morning and afternoon time periods. The intersections evaluated included: Long Beach Boulevard and Imperial Highway (Lynwood); Wilshire Boulevard and Veteran Avenue (Westwood); Sunset Boulevard and Highland Avenue (Hollywood); and La Cienega Boulevard and Century Boulevard (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which has a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 parts per million ("ppm"), which indicates that the most stringent 1-hour CO standard (20.0 ppm) would likely not be exceeded until the daily traffic at the intersection exceeded more than 400,000 vehicles per day. Therefore, as described below, and based upon the projected daily traffic at intersections in the study area being well below 400,000 vehicles per day, a detailed CO "hot spots" analysis is not needed

<u>Proposed Project</u>

At full implementation of the Proposed Project, the highest average daily trips at an intersection affected by the Proposed Project would be approximately 68,600 at the Jamboree Road and Michelson Drive intersection, which is less than the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to SoCAB meteorology to conclude that the CO concentrations at the Jamboree Road and Michelson Drive intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP.

Impact Conclusion: *The Proposed Project would have a less than significant impact on local CO concentrations.*

<u>Alternative A</u>

For Alternative A, the highest average daily trips at an intersection affected by Alternative A would be approximately 68,700 at the Jamboree Road and Michelson Drive intersection, which is less than the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to SoCAB meteorology to conclude that the CO concentrations at the Jamboree Road and Michelson Drive intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP.

Impact Conclusion: *Alternative A would have a less than significant impact on local CO concentrations.*

<u>Alternative B</u>

For Alternative B, the highest average daily trips at an intersection affected by Alternative B would be approximately 69,000 at the Jamboree Road and Michelson Drive intersection, which is less than the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to SoCAB meteorology to conclude that the CO concentrations at the Jamboree Road and Michelson Drive intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP.

Impact Conclusion: *Alternative B would have a less than significant impact on local CO concentrations.*

Alternative C

For Alternative C, the highest average daily trips at an intersection affected by Alternative C would be approximately 69,300 at the Jamboree Road and Michelson Drive intersection, which is less than the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to SoCAB meteorology to conclude that the CO concentrations at the Jamboree Road and Michelson Drive intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP.

Impact Conclusion: *Alternative C would have a less than significant impact on local CO concentrations.*

No Project Alternative

The highest average daily trips at an intersection affected by the No Project Alternative would be approximately 68,100 at the Jamboree Road and Michelson Drive intersection, which is less than the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to SoCAB meteorology to conclude that the CO concentrations at the Jamboree Road and Michelson Drive intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP.

Impact Conclusion: *The No Project Alternative would have a less than significant impact on local CO concentrations.*

Threshold 4.1-2 Would the project expose sensitive receptors to substantial pollutant concentrations?

Health Risk

A health risk assessment to analyze cancer risks and non-carcinogenic hazards from Project operations was prepared as described in Section 4.1.3. In addition to cancer, exposure to TACs may result in impacts to the respiratory system including inflammation and bronchial irritation, impacts to the nervous system, immune system, reproductive system, the kidneys, and the eyes - including eye irritation, and developmental impacts

Health risks were calculated for Phase 3 emissions of the Proposed Project and alternatives because Phase 3 emissions are the highest; therefore, the utilization of Phase 3 results for the entire exposure period is conservative. The results of the health risk assessment are shown in Table 4.1-23

TABLE 4.1-23
HEALTH RISK ASSESSMENT FROM OPERATIONS

Health Endpoint	Receptor	Maximum Estimated Incremental Risk (Risk in 1 million)					SCAQMD Threshold (Risk in 1 million)
		Proposed Project	Alternative A	Alternative B	Alternative C	No Project Alternative	
Cancer Risk	Resident	2.4	3.5	3.0	5.9	2.2	≥10
	Sensitive	1.5	2.1	1.8	3.6	1.3	≥10
	Worker	3.7	5.2	4.5	8.8	3.3	≥10
Cancer Burden	All	0.14	0.28	0.21	**0.81**	0.11	≥0.5
Health Endpoint	**Receptor**	**Maximum Estimated Hazard Index**					**SCAQMD Threshold**
		Proposed Project	**Alternative A**	**Alternative B**	**Alternative C**	**No Project Alternative**	
Chronic Non-Cancer Hazard Index	Resident	0.051	0.072	0.062	0.12	0.046	≥1.0
	Sensitive	0.031	0.044	0.038	0.075	0.028	≥1.0
	Worker	0.093	0.13	0.11	0.22	0.083	≥1.0
Acute Non-Cancer Hazard Index	Resident	0.53	0.75	0.64	**1.3**	0.47	≥1.0
	Sensitive	0.60	0.86	0.7	**1.4**	0.54	≥1.0
	Worker	**1.0**	**1.5**	**1.2**	**2.5**	0.92	≥1.0

SCAQMD: South Coast Air Quality Management District

Bold indicates exceedance of the SCAQMD threshold.

Source: *Air Quality Technical Report,* Table 5.4-1, Environ 2014.

Proposed Project

The Proposed Project cancer risks to all receptors would be less than four in one million and would not exceed the SCAQMD significance threshold of greater than or equal to ten in one million. The cancer burden estimate for the Proposed Project, which is the estimated incremental number of cancer cases in the area where the incremental cancer risk is estimated at greater than or equal to 1 in 1 million, would be approximately 0.14, which is less than the SCAQMD significance threshold of equal to or greater than 0.5.

The Proposed Project chronic non-cancer hazard index ("HI") for all receptors would be less than 0.1 and would not exceed the SCAQMD significance threshold of greater than or equal to 1.0. The acute non-cancer HI for residents and other sensitive receptors would be less than the SCAQMD significance threshold of greater than or equal to 1.0. However, the acute non-cancer HI for workers would equal the SCAQMD significance threshold and is considered to be a significant impact.

Impact Conclusion: *The Proposed Project would have less than significant impacts for cancer risk, cancer burden, and chronic non-cancer risk for all receptors and for acute non-cancer risk for residents and other sensitive receptors. The Proposed Project would have a significant acute non-cancer health risk impact for workers.*

Alternative A

Alternative A cancer risks to all receptors would be less than six in one million and would not exceed the SCAQMD significance threshold of greater than or equal to ten in one million. The cancer burden estimate for Alternative A, which is the estimated incremental number of cancer cases in the area where the incremental cancer risk is estimated at greater than or equal to 1 in 1 million, would be approximately 0.28, which is less than the SCAQMD significance threshold of equal to or greater than 0.5.

The Alternative A chronic non-cancer hazard index ("HI") for all receptors would be less than 0.2 and would not exceed the SCAQMD significance threshold of greater than or equal to 1.0. The acute non-cancer HI for residents and other sensitive receptors would be less than the SCAQMD significance threshold of greater than or equal to 1.0. However, the acute non-cancer HI for workers is estimated at 1.5, would exceed the SCAQMD significance threshold, and is considered to be a significant impact.

Impact Conclusion: *Alternative A would have less than significant impacts for cancer risk, cancer burden, and chronic non-cancer risk for all receptors and for acute non-cancer risk for residents and other sensitive receptors. Alternative A would have a significant acute non-cancer health risk impact for workers.*

Alternative B

Alternative B cancer risks to all receptors would be less than five in one million and would not exceed the SCAQMD significance threshold of greater than or equal to ten in one million. The cancer burden estimate for Alternative B, which is the estimated incremental number of cancer cases in the area where the incremental cancer risk is estimated at greater than or equal to 1 in

1 million, would be approximately 0.21, which is less than the SCAQMD significance threshold of equal to or greater than 0.5.

The Alternative B chronic non-cancer hazard index ("HI") for all receptors would be less than 0.2 and would not exceed the SCAQMD significance threshold of greater than or equal to 1.0. The acute non-cancer HI for residents and other sensitive receptors would be less than the SCAQMD significance threshold of greater than or equal to 1.0. However, the acute non-cancer HI for workers is estimated at 1.2, would exceed the SCAQMD significance threshold, and is considered to be a significant impact.

Impact Conclusion: *Alternative B would have less than significant impacts for cancer risk, cancer burden, and chronic non-cancer risk for all receptors and for acute non-cancer risk for residents and other sensitive receptors. Alternative B would have a significant acute non-cancer health risk impact for workers.*

Alternative C

Alternative C cancer risks to all receptors would be less than nine in one million and would not exceed the SCAQMD significance threshold of greater than or equal to ten in one million. The cancer burden estimate for the Alternative C, which is the estimated incremental number of cancer cases in the area where the incremental cancer risk is estimated at greater than or equal to 1 in 1 million, would be approximately 0.81, which exceeds the SCAQMD significance threshold of equal to or greater than 0.5 and is considered to be a significant impact.

The Alternative C chronic non-cancer hazard index ("HI") for all receptors would be less than 0.3 and would not exceed the SCAQMD significance threshold of greater than or equal to 1.0. The acute non-cancer HI for all receptors would exceed the SCAQMD significance threshold of greater than or equal to 1.0 and is considered to be a significant impact.

Impact Conclusion: *Alternative C would have less than significant impacts for cancer risk and chronic non-cancer risk for all receptors. Alternative C would have significant impacts for cancer burden and for acute non-cancer health risk for all receptors.*

No Project Alternative

The No Project Alternative cancer risks to all receptors would be less than four in one million and would not exceed the SCAQMD significance threshold of greater than or equal to ten in one million. The cancer burden estimate for the No Project Alternative, which is the estimated incremental number of cancer cases in the area where the incremental cancer risk is estimated at greater than or equal to 1 in 1 million, would be approximately 0.11, which is less than the SCAQMD significance threshold of equal to or greater than 0.5.

The No Project Alternative chronic non-cancer hazard index ("HI") for all receptors would be less than 0.1 and would not exceed the SCAQMD significance threshold of greater than or equal to 1.0. The acute non-cancer HI for all receptors would be less than the SCAQMD significance threshold of greater than or equal to 1.0.

Impact Conclusion: *The No Project Alternative would have less than significant impacts for cancer risk, cancer burden, chronic non-cancer risk, and for acute non-cancer risk.*

Threshold 4.1-3 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

The cumulative impacts analysis for air quality is based on the guidance provided by SCAQMD.

> As Lead Agency, the [SCAQMD] uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant.

The Project region is a federal or State nonattainment area for O_3 (VOC and NOx precursors), NO_2, PM10, and PM2.5 (Table 4.1-4).

Proposed Project

Phase 1

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 1 of the Proposed Project would exceed the SCAQMD mass daily significance NOx threshold. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 2

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 2 of the Proposed Project would exceed the SCAQMD mass daily significance VOC and NOx thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 3

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 3 of the Proposed Project would exceed the SCAQMD mass daily significance VOC, NOx, and PM10 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Impact Conclusion: *The Proposed Project operational emissions would have a significant cumulative impact on nonattainment pollutants for all phases.*

Alternative A

Phase 1

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 1 of Alternative A would exceed the SCAQMD mass daily significance NOx threshold. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 2

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 2 of Alternative A would exceed the SCAQMD mass daily significance NOx threshold. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 3

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 3 of Alternative A would exceed the SCAQMD mass daily significance VOC, NOx, and PM10 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 annual, and PM2.5 24-hour SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Impact Conclusion: *Alternative A operational emissions would have a significant cumulative impact on nonattainment pollutants for all phases.*

Alternative B

Phase 1

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 1 of Alternative B would exceed the SCAQMD mass daily significance NOx threshold. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 2

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 2 of Alternative B would exceed the SCAQMD mass daily significance VOC, NOx, PM10, and PM2.5 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 3

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 3 of Alternative B would exceed the SCAQMD mass daily significance VOC, NOx, PM10, and PM2.5 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS and NO_2 1-hour and PM2.5 annual NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Impact Conclusion: *Alternative B operational emissions would have a significant cumulative impact on nonattainment pollutants for all phases.*

Alternative C

Phase 1

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 1 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS and NO_2 1-hour and PM2.5 annual NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 2

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 2 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS and NO_2 1-hour, SO_2 1-hour, and PM2.5 annual NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Phase 3

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of Phase 3 of Alternative C would exceed the SCAQMD mass daily significance VOC, NOx, SOx, PM10, and PM2.5 thresholds. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, NO_2 annual, PM10 24-hour, PM10 annual, and PM2.5 24-hour SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, PM10 annual, and PM2.5 annual CAAQS and NO_2 1-hour, SO_2 1-hour, and PM2.5 annual NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Impact Conclusion: *Alternative C operational emissions would have a significant cumulative impact on nonattainment pollutants for all phases.*

No Project Alternative

As shown in the analysis of Threshold 4.1-1, CAP emissions from implementation of the No Project Alternative would exceed the SCAQMD mass daily significance NOx threshold. As shown in the analysis of Threshold 4.1-2, CAP emissions would exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual SCAQMD ambient air quality thresholds and would also exceed the NO_2 1-hour, PM10 24-hour, and PM10 annual CAAQS and NO_2 1-hour NAAQS. Therefore, emissions of these nonattainment pollutants and precursors would be cumulatively considerable.

Impact Conclusion: *The No Project Alternative operational emissions would have a significant cumulative impact on nonattainment pollutants.*

Threshold 4.1-4 Would the project conflict with or obstruct implementation of the applicable air quality plan?

For purposes of this analysis, the applicable air quality plan is SCAQMD's 2012 AQMP.

As discussed Section 4.1.2, the SCAQMD has adopted the 2012 AQMP. The AQMP includes strategies and tactics to be used to attain the NAAQS and CAAQS in the SoCAB. Included in the AQMP are assumptions for aircraft emissions for JWA. These emissions are based on an assumption that JWA will have 166,327 LTOs in 2035. The LTOs assumed for the Proposed Project and alternatives are shown in the *Air Quality Technical Report* (Appendix D, see Table 3.1-3).

Proposed Project

Phase 1

Phase 1 would have an estimated 205,200 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 1 of the Proposed Project would be inconsistent with the 2012 AQMP.

Phase 2

Phase 2 would have an estimated 196,666 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 2 of the Proposed Project would be inconsistent with the 2012 AQMP.

Phase 3

Phase 3 would have an estimated 188,236 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 3 of the Proposed Project would be inconsistent with the 2012 AQMP.

Impact Conclusion: *The Proposed Project would have a significant impact relative to consistency with the 2012 Air Quality Management Plan.*

Alternative A

Phase 1

Phase 1 would have an estimated 203,807 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 1 of Alternative A would be inconsistent with the 2012 AQMP.

Phase 2

Phase 2 would have an estimated 193,043 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 2 of Alternative A would be inconsistent with the 2012 AQMP.

Phase 3

Phase 3 would have an estimated 187,233 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 3 of Alternative A would be inconsistent with the 2012 AQMP.

Impact Conclusion: *Alternative A would have a significant impact relative to consistency with the 2012 Air Quality Management Plan.*

Alternative B

Phase 1

Phase 1 would have an estimated 204,250 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 1 of Alternative B would be inconsistent with the 2012 AQMP.

Phase 2

Phase 2 would have an estimated 201,836 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 2 of Alternative B would be inconsistent with the 2012 AQMP.

Phase 3

Phase 3 would have an estimated 199,718 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 3 of Alternative B would be inconsistent with the 2012 AQMP.

Impact Conclusion: *Alternative B would have a significant impact relative to consistency with the 2012 Air Quality Management Plan.*

Alternative C

Phase 1

Phase 1 would have an estimated 235,220 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 1 of Alternative C would be inconsistent with the 2012 AQMP.

Phase 2

Phase 2 would have an estimated 222,220 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 2 of Alternative C would be inconsistent with the 2012 AQMP.

Phase 3

Phase 3 would have an estimated 210,220 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of Phase 3 of Alternative C would be inconsistent with the 2012 AQMP.

Impact Conclusion: *Alternative C would have a significant impact relative to consistency with the 2012 Air Quality Management Plan.*

No Project Alternative

The No Project Alternative would have an estimated 205,200 LTOs, which exceeds the 2012 AQMP assumption; thus, implementation of the No Project Alternative would be inconsistent with the 2012 AQMP.

Impact Conclusion: *The No Project Alternative would have a significant impact relative to consistency with the 2012 Air Quality Management Plan.*

4.1.7 MITIGATION PROGRAM

As discussed in Thresholds 4.1-1, 4.1-2, 4.1-3, and 4.1-4, the Proposed Project's CAP and TAC emissions would result in significant environmental impacts. As discussed in Section 4.1.4, the ACRP's Report 56, *Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports* provides an inventory of practical, low-cost strategies to reduce and manage GHG, CAP, and TAC emissions. Strategies currently implemented at JWA are shown in Table 4.1-6. Another group of strategies was determined to be inapplicable and/or infeasible for JWA. These strategies are listed in Table A-2 of Appendix A, the Air Quality Technical Report.

The County of Orange has identified additional mitigation measures that would be implemented in order to lessen the Project's air quality impacts. Of the 15 mitigation measures identified and listed below, only the pollutant emissions reduction attributable to the GSE electrification mitigation measure, AQ/GHG-5(i), were quantified in this impact analysis. This limited quantification is conservative and appropriate in light of the uncertainty regarding the specific emission reduction benefits attributable to many of the mitigation measures. Further, because of he County of Orange's inability to directly regulate or improve tailpipe emissions from aircraft and other mobile sources, which are subject to federal and State regulations, even with adoption and implementation of these mitigation measures, the identified mass emissions, local concentrations, and health risk air quality impacts would be significant and unavoidable. (Note: for each mitigation measure's corresponding ACRP Strategy, please see Table 1.1-1 of Appendix D).

AQ/GHG-1 Upon Project approval, the County of Orange shall support single/reduced engine taxiing procedures authorized by the Federal Aviation Administration ("FAA") that achieve corresponding benefits in air quality and/or greenhouse gas ("GHG") emission reductions and do not result in adverse noise impacts.

AQ/GHG-2 Upon Project approval, the County of Orange shall support the efforts of the airport industry—including those of the FAA, commercial air carriers, and aircraft manufacturers —to develop air quality and Greenhouse Gas ("GHG") emission benchmarking databases that improve the understanding of the relative efficiencies of aviation operations by actively participating in aviation community networks and participating in the biannual Airports Council International – North America ("ACI-NA") Environmental Benchmark Survey.

AQ/GHG-3 Upon Project approval, the County of Orange shall continue to evaluate the effects of future Airport-related improvement projects cognizant of and informed by the resulting air quality and GHG emissions in accordance with the requirements of the California Environmental Quality Act ("CEQA").

AQ/GHG-4 By January 1, 2018, the County of Orange shall develop and adopt a Climate Action Plan for greenhouse gas emissions sources at the Airport under the County's control. The Climate Action Plan shall be consistent with the requirements of the Global Warming Solutions Act of 2006 ("AB 32") and the goals of Executive Order S-3-05.

In order to secure greenhouse gas emission reductions from sources under the County's control, the Climate Action Plan shall identify one or more of the following greenhouse gas reduction strategies, or combination thereof.

i. Maximizing the energy efficiency of existing Airport structures and facilities through retrofitting and redevelopment at the conclusion and/or expiration of their useful life;

ii. Tracking energy use at intervals no less than every 12 months in order to allow for the efficient optimization of energy use;

iii. Utilizing energy-efficient (light-emitting diode ["LED"] or equivalent) lighting on the airfield, within terminal buildings, and in connection with surface and parking lot security lighting;

iv. Installing window awnings, sunshades, or window tinting in appropriate areas;

v. Providing a minimum of 60 electric car charging stations consistent with AQ/GHG-11 below;

vi. Increasing the purchase and use of renewable energy;

vii. Requiring third parties, concurrent with the execution of new, renewed or amended lease or contractual agreements, to meet the more stringent energy efficiency requirements required in AQ/GHG-5 below;

viii. Continuing to maximize use of hybrid or alternatively fueled on-site equipment, including equipment fueled by Clean Natural Gas ("CNG"), Liquified Natural Gas ("LNG"), or Biodiesel;

ix. Installing light colored "cool" roofs and cool pavements in any new development subsequently proposed at the Airport;

x. Purchasing carbon offset credits through an adopted program such as the California Air Pollution Control Officer's Association ("CAPCOA's") Greenhouse Gas Reduction Exchange ("Rx") Registry, of which the the South Coast Air Quality Management District ("SCAQMD") is a participating air district (www.ghgrx.org);

xi. Increasing solid waste reduction and recycling in accordance with AQ/GHG-10 below; and/or

xii. Collaborating with commercial air carriers to reduce ground-based aircraft engine greenhouse gas emissions through single engine taxiing ("SET") for purposes of taxi-in and taxi-out between the runway ends and terminal areas to the extent feasible and without compromising passenger safety and aircraft engine operational considerations.

The above list of greenhouse gas reduction strategies is non-exclusive and can be supplemented by any additional strategies subsequently identified by the County of Orange.

In order to ensure progress in implementation of the Climate Action Plan and its reduction objectives, the County of Orange shall conduct annual greenhouse gas emission inventories for all stationary sources and other sources over which JWA has control.

AQ/GHG-5 Upon Project approval, the County of Orange shall specify energy efficiency requirements and goals for equipment and appliances in contractual agreements, as applicable. At a minimum:

i. Concurrent with the execution of lease agreements, amendments, and/or renewals with commercial air carriers, the County of Orange shall set a Ground Support Equipment electrification requirement of a 15 percent increase above baseline by 2016, 35 percent above baseline by 2021, and 50 percent increase above baseline by 2026. (The baseline electrification conditions are established by reference to calendar year 2013.)

ii. Concurrent with the execution of lease agreements, amendments, and/or renewals with all applicable Airport tenants, the County of Orange shall require that any new equipment or appliances purchased by the tenant for the provision of services under its contract with JWA shall be ENERGY STAR rated or equivalent, to the extent such equipment and appliances are commercially and technologically available.

iii. Concurrent with the execution of lease agreements, amendments, and/or renewals with all applicable Airport tenants, the County of Orange shall require that all tenants develop, implement and submit to the Airport—within six months of lease execution—a fleet-wide, anti-idling policy. At a minimum, the anti-idling policy shall include the requirement that vehicle engines shall be turned off when vehicles are not occupied, and that occupied vehicles be turned off after no more than a five-minute idling period.

AQ/GHG-6 Upon Project approval, the County of Orange shall install energy efficient equipment and controls for equipment being replaced as technologically available.

AQ/GHG-7 Upon Project approval, the County of Orange shall install variable speed drives and optimize the control of air handling unit pumps for equipment being replaced as technologically available.

AQ/GHG-8 Upon Project approval, and as technologically available, the County of Orange shall install energy efficient elevators and escalators as the existing ones require replacement.

AQ/GHG-9 By 2016, the County of Orange shall optimize the energy efficiency and control of the conveyor motors in the baggage handling system by adding more "photo eyes" to track bags and reduce the time that the system runs after a bag has gone through from 20 minutes to 10 minutes. The County of Orange also will replace the older electric conveyor drive motors in Terminals A and B with new, more efficient ones capable of variable frequency by 2016.

AQ/GHG-10 By 2016, the County of Orange shall develop an Integrated Solid Waste Management Plan ("ISWMP") that strives to achieve the policy goal of the State of California—set forth in Section 41780.01 of the *California Public Resources Code*—that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020, and annually thereafter. In furtherance of the State's policy goal, the ISWMP shall evaluate further improvements to the Airport's existing solid waste diversion rate through enhanced recycling and composting opportunities.

AQ/GHG-11 By 2016, the County of Orange shall install electric vehicle chargers in public parking structures A1, A2, B2 and C, the Main Street parking lot, and the employee parking lots. Chargers will be located close to the terminals to give preference to the electric vehicle users. By 2021, the County of Orange shall also provide preferential parking for vehicles powered by compressed natural gas and other low emission sources.

JWA's parking program ("PARCS") will be used to track the demand/use of the low emission vehicle spaces/chargers, and the County of Orange will re-evaluate the percentage/quantity of spaces required every two years. the County of Orange will optimize the efficiency of the parking program and adjust it according to future demands for electric chargers and the other types of low-emission vehicles driven by the public.

AQ/GHG-12 Upon Project approval, the County of Orange shall support the expansion of public transit opportunities to the Airport by coordinating with the Orange County Transportation Authority ("OCTA"), Irvine iShuttle, and MetroLink upon the request of the transit providers. Additionally, the County of Orange will continue to make available—on the Airport's website—current information about public transit options that can be utilized to access the Airport.

AQ/GHG-13 Upon Project approval, the County of Orange shall support bicycle use by Airport employees and the air traveling public by providing convenient, secure bicycle racks for use on the Airport's premises.

AQ/GHG-14 Upon Project approval, the County of Orange shall continue to support the use of alternatively fueled taxis and shuttles through the Request for Proposal process and in the contractual agreements (all taxis are currently CNG). JWA also shall support the use of alternatively fueled rental vehicles by providing electricity for chargers where practicable by 2020.

AQ/GHG-15 Upon Project approval, the County of Orange shall support the efforts of commercial air carriers to utilize paperless ticket technology by upgrading the current kiosks and Common Use Passenger Processing System ("CUPPS") system with new, more efficient technology as it becomes commercially available.

4.1.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Even with implementation of the mitigation measures identified above, impacts from the CAP and TAC emissions for the Proposed Project and Alternatives A, B, and C would be significant and unavoidable. Impacts with the No Project Alternative would also be significant and unavoidable; however, with this alternative the mitigation measures, other than those that continue existing programs, would not apply because the action would be to allow the Settlement Agreement to expire.

Table 4.1-24 provides a summary of the findings of significance after implementation of the mitigation measures for each threshold for each alternative. Each of the three phases is addressed.

TABLE 4.1-24
SUMMARY OF AIR QUALITY IMPACTS

Threshold	Proposed Project	Alternative A	Alternative B	Alternative C	No Project Alternative
Threshold 4.1-1	**Mass Daily Emissions – CAP** Significant and unavoidable impact **Ambient Air Quality Standards** Significant and unavoidable impact **Local CO Hotspots** Less than significant impact	**Mass Daily Emissions – CAP** Significant and unavoidable impact **Ambient Air Quality Standards** Significant and unavoidable impact **Local CO Hotspots** Less than significant impact	**Mass Daily Emissions – CAP** Significant and unavoidable impact **Ambient Air Quality Standards** Significant and unavoidable impact **Local CO Hotspots** Less than significant impact	**Mass Daily Emissions – CAP** Significant and unavoidable impact **Ambient Air Quality Standards** Significant and unavoidable impact **Local CO Hotspots** Less than significant impact	**Mass Daily Emissions – CAP** Significant and unavoidable impact **Ambient Air Quality Standards** Significant and unavoidable impact **Local CO Hotspots** Less than significant impact
Threshold 4.1-2	**Health Risk-Cancer and Cancer Burden** Less than significant impact **Chronic Non-Cancer** Less than significant impact **Acute Non-Cancer** Significant and unavoidable impact to workers	**Health Risk-Cancer and Cancer Burden** Less than significant impact **Chronic Non-Cancer** Less than significant impact **Acute Non-Cancer** Significant and unavoidable impact to workers	**Health Risk-Cancer and Cancer Burden** Less than significant impact **Chronic Non-Cancer** Less than significant impact **Acute Non-Cancer** Significant and unavoidable impact to workers	**Health Risk-Cancer** Less than significant impact **Cancer Burden** Significant and unavoidable impact **Chronic Non-Cancer** Less than significant impact **Acute Non-Cancer** Significant and unavoidable impact to all receptors	**Health Risk Cancer and Cancer Burden** Less than significant impact **Chronic Non-Cancer** Less than significant impact **Acute Non-Cancer** Less than significant impact
Threshold 4.1-3	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact
Threshold 4.1-4	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact	Significant and unavoidable impact

4.1.9 REFERENCES

AECOM. 2014 (April). *John Wayne Airport Settlement Agreement Amendment Environmental Impact Report Aviation Forecasts Technical Report.* Orange, CA: AECOM.

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