4.3 Air Quality

This section describes the existing air quality conditions of the project site and vicinity, identifies associated regulatory requirements, provides significance thresholds and project design features (PDFs), evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed project. In addition to the documents listed in Section 4.3.9, References, information contained in this section is based on the following:

- **Appendix B-1:** CalEEMod Output Files, prepared by Dudek, dated March 2025
- **Appendix B-2:** Construction Health Risk Assessment, prepared by Dudek, dated 2025
- **Appendix B-3:** Carbon Monoxide Hotspots Intersection Volume Calculations (CO Hotspots Calculations), prepared by Dudek, dated March 2025

4.3.1 Existing Conditions

The project site is located in the City of Irvine (City) within the South Coast Air Basin (SCAB). The SCAB is a 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The SCAB's air pollution problems are a consequence of the combination of emissions from the nation's second-largest urban area, meteorological conditions that hinder dispersion of those emissions, and mountainous terrain surrounding the SCAB that traps pollutants as they are pushed inland with the sea breeze (SCAQMD 2022). Meteorological and topographical factors that affect air quality in the SCAB are described below.

Climate and Meteorology

The SCAB generally lies in the semi-permanent, high-pressure zone of the eastern Pacific. As a result, the climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the SCAB is a function of the area's natural physical characteristics (e.g., weather and topography) as well as of human influences (e.g., development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the SCAB.

Moderate temperatures, comfortable humidity, and limited precipitation characterize the climate in the SCAB. The average annual temperature varies little throughout the basin, averaging 75°F. However, with a less pronounced oceanic influence, the eastern inland portions of the basin show greater variability in annual minimum and maximum temperatures. All portions of the SCAB have recorded temperatures over 100°F in recent years. Although the SCAB has a semiarid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry air is brought into the basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70% at the coast and 57% in the eastern part of the basin. Precipitation in the SCAB is typically 9 to 14 inches annually and is rarely in the form of snow or hail, due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the basin.

Sunlight

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain "primary" pollutants (mainly reactive hydrocarbons and oxides of nitrogen [NO_x])[1] react to form "secondary" pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind of the emission sources. Southern California also has

1 NO_x is a general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen.

abundant sunshine, which drives the photochemical reactions that form pollutants such as ozone (O_3) and a substantial portion of fine particulate matter ($PM_{2.5}$; particles less than or equal to 2.5 microns in diameter). In the SCAB, high concentrations of O_3 are normally recorded during the late spring, summer, and early autumn months, when more intense sunlight drives enhanced photochemical reactions. Because of the prevailing daytime winds and time-delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of Southern California.

Temperature Inversions

Under ideal meteorological conditions and irrespective of topography, pollutants emitted into the air mix and disperse into the upper atmosphere. However, the Southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground. The inversion, a layer of warm, dry air overlaying cool, moist marine air, is a normal condition in coastal Southern California. The cool, damp, and hazy sea air capped by coastal clouds is heavier than the warm, clear air, which acts as a lid through which the cooler marine layer cannot rise. The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above mean sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet above mean sea level, the terrain prevents the pollutants from entering the upper atmosphere, resulting in the pollutants settling in the foothill communities. Below 1,200 feet above mean sea level, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the daylight hours.

Mixing heights for inversions are lower in the summer and inversions are more persistent, being partly responsible for the high levels of O_3 observed during summer months in the SCAB. Smog in Southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods, allowing them to form secondary pollutants by reacting in the presence of sunlight. The basin has a limited ability to disperse these pollutants due to typically low wind speeds and the surrounding mountain ranges.

As with other cities within the SCAB, the City of Irvine is susceptible to air inversions, which trap a layer of stagnant air near the ground where pollutants are further concentrated. These inversions produce haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources. Elevated concentrations of coarse particulate matter (PM_{10}; particles less than or equal to 10 microns in diameter) and of $PM_{2.5}$ can occur in the SCAB throughout the year, but they occur most frequently in fall and winter. The deficit of normal storm systems from late fall through the winter and early spring allow for more stagnant conditions in the SCAB as the lack of storm-related dispersion and rain-out of particulate matter (PM) and its precursors. Although there are some changes in emissions by day of the week and by season, the observed variations in pollutant concentrations are primarily the result of seasonal differences in weather conditions.

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The national and California standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants. These pollutants, as well as toxic air contaminants (TACs), are discussed below.[2]

2 The descriptions of each of the criteria air pollutants and associated health effects are based on the U.S. Environmental Protection Agency's Criteria Air Pollutants (EPA 2018) and the California Air Resources Board's Glossary of Air Pollutant Terms (CARB 2025a).

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors, such as hydrocarbons and NO_x. These precursors are mainly NO_x and volatile organic compounds (VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere ozone layer (stratospheric O_3) as well as at the earth's surface in the troposphere (ground-level O_3).[3] The O_3 that the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level ozone is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" ozone. Stratospheric ozone, or "good" ozone, occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the earth's atmosphere. Without the protection of the beneficial stratospheric ozone layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as those who are sick, older adults, and young children.

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies on the effects of O_3 on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents, and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2025b).

Nitrogen Dioxide and Oxides of Nitrogen. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

3 The troposphere is the layer of the earth's atmosphere nearest to the surface of the earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence and the health basis for the ambient air quality standards for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher exposure levels compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness than adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2025c).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, older adults, and people with anemia or a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2025d).

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure than the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. Older adults and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2025e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in PM (ELC 2024). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than in healthy people. This increase in resistance also correlates with the severity of their asthma. SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter. PM pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. PM can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also produce haze and reduce regional visibility and damage and discolor surfaces on which they settle.

A number of adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2025f).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that PM in outdoor air pollution causes lung cancer (CARB 2025f).

Lead. Lead in the atmosphere occurs as PM. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead (CARB 2025g).

Sulfates. Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere and can result in respiratory impairment and reduced visibility (CARB 2025h).

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in the air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer (CARB 2025i).

Hydrogen Sulfide. Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations (CARB 2025j).

Visibility-Reducing Particles. Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above (CARB 2025k).

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint (CARB 2025l).

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

Non-Criteria Air Pollutants

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the state of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill 2588 (CARB 2025m), was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC (CARB 2025n).

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70 the diameter of a human hair) and thus is a subset of $PM_{2.5}$ (CARB 2025o). DPM is typically composed of carbon particles ("soot," also called black carbon, or BC) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies. Those most vulnerable to non-cancer health effects are children whose lungs are still developing and older adults who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. In a phenomenon known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors (Piccardo et al. 2022).

Valley Fever. Coccidioidomycosis, more commonly known as "valley fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The fungus is very prevalent in the soils of California's San Joaquin Valley, particularly in Kern County. The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline, sandy soils.

Orange County is not considered a highly endemic county ("highly endemic" meaning more than 20 cases annually of valley fever per 100,000 people) based on the incidence rates reported through 2022. The latest report from the California Department of Public Health indicates that Orange County had 297 cases in 2022, or 9.4 cases per 100,000 people (CDPH 2023).

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, older adults, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution–sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution–sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The South Coast Air Quality Management District (SCAQMD) identifies sensitive receptors as residences, schools, playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes (SCAQMD 1993).

The closest off-site sensitive receptors to the proposed project are single-family residences, located approximately 200 feet west of the project site.

MATES V

The Multiple Air Toxics Exposure Study V (MATES V) is a monitoring and evaluation study conducted in the SCAB. The study is a follow up to previous air toxics studies in the SCAB and is part of the SCAQMD Governing Board Environmental Justice Initiative.

MATES V consists of several elements. These include a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize risk across the SCAB. The study estimates air toxics cancer risks using a risk assessment approach. Additionally, MATES V includes an exploratory analysis of chronic non-cancer health impacts (e.g., cardiovascular, respiratory, and neurological health outcomes). The MATES analysis does not estimate impacts on risk of death or other health effects from criteria air pollutant exposures; such analyses are instead conducted as part of the air quality management plans (AQMPs).

Toxic air pollution in the SCAB has decreased by more than 54% between 2012 and 2018 but continues to contribute to health risks, including cancers and other chronic diseases. For residents in the SCAB in 2018, exposure to TACs increased the chances of developing cancer by 455 chances in 1 million (SCAQMD 2025).

At the project site, the MATES V monitoring data shows a cancer risk of 366 chances in 1 million. In the project's zip code, the MATES V monitoring shows a cancer risk of 388 chances in 1 million. Air toxics cancer risk in this zip code is higher than 28% of the SCAB population (SCAQMD 2025).

CalEnviroScreen

CalEnviroScreen is a mapping tool that helps identify California communities that are most affected by many sources of pollution, where people are often especially vulnerable to pollution's effects. CalEnviroScreen ranks census tracts in California based on potential exposures to pollutants, adverse environmental conditions, socioeconomic factors, and the prevalence of certain health conditions. Data used in the CalEnviroScreen model come from national and state sources.

The project site is not in a disadvantaged community pursuant to Senate Bill 535 (OEHHA 2022), in a low-income community pursuant to Assembly Bill 1550 (CARB 2023a), or in a Community Air Protection Program pursuant to Assembly Bill 617 (CARB 2023b).

The project site achieves scores of 20–25 on CalEnviroScreen (OEHHA 2023). The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Healthy Places Index

The Healthy Places Index (HPI) is a project of the Public Health Alliance of Southern California. The HPI is a powerful and easy-to-use data and policy platform created to advance health equity through open and accessible data. Neighborhood-by-neighborhood, the HPI maps data on social conditions that drive health—like education, job opportunities, clean air and water, and other indicators that are positively associated with life expectancy at birth. Community leaders, policymakers, academics, and other interested parties use the HPI to compare the health and well-being of communities, identify health inequities, and quantify the factors that shape health.

The project site has an HPI score of 87.8 (California Healthy Places Index 2025). The maximum HPI score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

4.3.2 Relevant Plans, Policies, and Ordinances

Federal

Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort (42 USC 7401 et seq.). EPA is responsible for implementing most aspects of the Clean Air Act, including the setting of National Ambient Air Quality Standards (NAAQS; federal standards) for major air pollutants, hazardous air pollutant (HAP) standards, approval of state attainment plans, motor vehicle emission standards, stationary source emissions standards and permits, acid rain control measures, stratospheric O_3 protection, and enforcement provisions. Federal standards are established for criteria pollutants under the Clean Air Act, which are O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The federal standards describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The federal standards (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. Federal standards for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires EPA to reassess the federal standards at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the federal standards to the states. States with areas that exceed the federal standards must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act Amendments required EPA to identify national emission standards for HAPs to protect public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs (EPA 2025a).

State

California Clean Air Act

In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below these relevant CAAQS before a basin can attain the corresponding CAAQS. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

California air districts have based their thresholds of significance for California Environmental Quality Act (CEQA) purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date for the NAAQS or CAAQS. Since an ambient air quality standard is based on maximum pollutant levels in outdoor air that would not harm the public's health and air district thresholds pertain to attainment of the ambient air quality standard, the thresholds established by air districts are also protective of human health (CARB 2025p).

The NAAQS and CAAQS are presented in Table 4.3-1, Ambient Air Quality Standards.

Table 4.3-1. Ambient Air Quality Standards

Pollutant	Average Time	CAAQS[a]	NAAQS[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
O_3	1 hour	0.09 ppm (180 μg/m^3)	N/A	Same as primary standard
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	Same as primary standard
	Annual arithmetic mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	

Table 4.3-1. Ambient Air Quality Standards

Pollutant	Average Time	CAAQS[a]	NAAQS[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	N/A
	3 hours	N/A	N/A	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	N/A
	Annual	N/A	0.030 ppm (for certain areas)[g]	N/A
PM_{10}[i]	24 hours	50 μg/m³	150 μg/m³	Same as primary standard
	Annual arithmetic mean	20 μg/m³	N/A	
$PM_{2.5}$[i]	24 hours	No separate state standard	35 μg/m³	Same as primary standard
	Annual arithmetic mean	12 μg/m³	9.0 μg/m³	15.0 μg/m³
Lead[j,k]	30-day average	1.5 μg/m³	N/A	N/A
	Calendar quarter	N/A	1.5 μg/m³ (for certain areas)[j]	Same as primary standard
	Rolling 3-month average	N/A	0.15 μg/m³	
H_2S	1 hour	0.03 ppm (42 μg/m³)	N/A	N/A
Vinyl chloride[i]	24 hours	0.01 ppm (26 μg/m³)	N/A	N/A
SO_4	24 hours	25 μg/m³	N/A	N/A
Visibility-reducing particles	8 hours (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	N/A	N/A

Source: CARB 2024.

Notes: CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards; O_3 = ozone; ppm = parts per million by volume; μg/m³ = micrograms per cubic meter; N/A = not applicable; NO_2 = nitrogen dioxide; CO = carbon monoxide; mg/m³ = milligrams per cubic meter; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; H_2S = hydrogen sulfide; SO_4 = sulfates; PST = Pacific standard time.

a. CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, and suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles—are values that are not to be exceeded. All others are not to be equaled or exceeded. The CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b. NAAQS (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
[f] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb, whereas California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
[h] In 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
[i] On February 7, 2024, the national annual $PM_{2.5}$ primary standard was lowered from 12.0 mg/m^3 to 9.0 mg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
[j] CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under Assembly Bill 1807 (Tanner). The California TAC list identifies more than 200 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code (CARB 2025n). In accordance with Assembly Bill 2728, the state list includes the federal HAPs. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Assembly Bill 2588) seeks to identify and evaluate risk from air toxics sources; however, Assembly Bill 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment (HRA) and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive diesel risk reduction plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment Program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. Several Airborne Toxic Control Measures reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Code of Regulations

The California Code of Regulations (CCR) is the official compilation and publication of regulations adopted, amended, or repealed by state agencies pursuant to the Administrative Procedure Act. The CCR includes regulations that pertain to air quality emissions. Specifically, Section 2485 in Title 13 of the CCR (13 CCR 2485) states that the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds) during construction shall be limited to 5 minutes at any location. In addition, 17 CCR 93115 states that operations of any stationary, diesel-fueled, compression-ignition engines shall meet specified fuel and fuel additive requirements and emissions standards.

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that "a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property." This section also applies to sources of objectionable odors.

Regional and Local

South Coast Air Quality Management District

SCAQMD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SCAB, where the proposed project site is located. SCAQMD operates monitoring stations in the SCAB, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. SCAQMD's AQMPs include control measures and strategies to be implemented to attain state and federal ambient air quality standards in the SCAB. SCAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Air Quality Management Plan

The most-recently adopted AQMP is the 2022 AQMP (SCAQMD 2022), which was adopted by the SCAQMD governing board on December 2, 2022. The 2022 AQMP is a regional blueprint for achieving air quality standards and healthful air. The 2022 AQMP was developed to address the requirements for meeting EPA's NAAQS for ground-level O_3. The SCAB is classified as an "extreme" nonattainment area, and the Coachella Valley is classified as a "severe-15" nonattainment area for the 2015 O_3 NAAQS. The strategies of the 2022 AQMP include wide adoption of zero-emissions technologies, low NO_x technologies where zero-emission technologies are not feasible, federal action, zero-emission technologies for residential and industrial sources, incentive funding in environmental justice areas, and prioritizing benefits for the most disadvantaged communities (SCAQMD 2022).

Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning

SCAQMD adopted its Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning in May 2005. The SCAQMD Guidance Document provides recommendations for the siting of new sensitive land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, gas dispensing facilities). In its Guidance Document, SCAQMD provides recommendations for when an HRA should be prepared, such as for truck stops and warehouse distribution facilities, where more than 100 trucks per day or more than 40 trucks with truck refrigeration units are generated (SCAQMD 2005).

Applicable Rules

Emissions that would result from stationary and area sources during operation under the proposed project may be subject to SCAQMD rules and regulations. The SCAQMD rules applicable to the project may include the following:

Regulation IV – Prohibitions

- **Rule 401 – Visible Emissions:** This rule establishes the limit for visible emissions from stationary sources for a period or periods aggregating more than 3 minutes in any hour. This rule prohibits visible emissions dark or darker than Ringelmann No. 1 for periods greater than 3 minutes in any hour or of such opacity that could obscure an observer's view to a degree equal or greater than does smoke.
- **Rule 402 – Nuisance:** This rule states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health or safety of any such persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property.
- **Rule 403 – Fugitive Dust:** This rule requires projects to prevent, reduce, or mitigate fugitive dust emissions from a site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM_{10} emissions to less than 50 micrograms per cubic meter, and restricts the tracking out of bulk materials onto public roads. Additionally, projects must utilize one or more of the best available control measures (identified in the tables within the rule), which may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers, and/or ceasing all activities.
- **Rule 431.2 – Sulfur Content of Liquid Fuels:** The purpose of this rule is to limit the sulfur content in diesel and other liquid fuels for the purpose of reducing the formation of SO_x and particulates during combustion and of enabling the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur diesel, and other liquid fuels for stationary source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile sources.

Regulation XI – Source Specific Standards

- **Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines**: This rule applies to stationary and portable engines rated at greater than 50 horsepower. The purpose of Rule 1110.2 is to reduce NO_x, VOCs, and CO emissions from engines. Emergency engines, including those powering standby generators, are generally exempt from the emissions and monitoring requirements of this rule because they have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.
- **Rule 1113 – Architectural Coatings:** This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

Regulation XIV – Toxics and Other Non-Criteria Pollutants:

- **Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities:** This rule states that an owner or operator of any demolition or renovation activity is required to have an asbestos study performed prior to demolition and to provide notification to SCAQMD prior to commencing demolition activities.

South Coast Air Basin Attainment Designation

Pursuant to the 1990 federal Clean Air Act Amendments, EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are re-designated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment" but based on the CAAQS rather than the NAAQS. Table 4.3-2 depicts the current attainment status of the project site with respect to the NAAQS and CAAQS.

Table 4.3-2. South Coast Air Basin Attainment Classification

Pollutant	Designation/Classification	
	NAAQS	CAAQS
Ozone (O_3), 1-hour	No national standard	**Nonattainment**
Ozone (O_3), 8-hour	**Extreme nonattainment**	**Nonattainment**
Nitrogen dioxide (NO_2)	Unclassifiable/attainment	Attainment
Carbon monoxide (CO)	Attainment/maintenance	Attainment
Sulfur dioxide (SO_2)	Unclassifiable/attainment	Attainment
Coarse particulate matter (PM_{10})	Attainment/maintenance	**Nonattainment**
Fine particulate matter ($PM_{2.5}$)	**Serious nonattainment**	**Nonattainment**
Lead	**Nonattainment**	Attainment
Hydrogen sulfide	No national standard	Unclassified
Sulfates	No national standard	Attainment
Visibility-reducing particles	No national standard	Unclassified
Vinyl chloride	No national standard	No designation

Sources: EPA 2025 (national); CARB 2023c (California).
Notes: NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; **bold text** = not in attainment; attainment = meets the standards; attainment/maintenance = achieves the standards after a nonattainment designation; nonattainment = does not meet the standards; unclassified or unclassifiable = insufficient data to classify; unclassifiable/attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

In summary, the SCAB is designated as a nonattainment area for federal and state O_3 standards and federal and state $PM_{2.5}$ standards. The SCAB is designated as a nonattainment area for state PM_{10} standards; however, it is designated as an attainment area for federal PM_{10} standards. The SCAB is designated as an attainment area for federal and state CO standards, federal and state NO_2 standards, and federal and state SO_2 standards. While the SCAB has been designated as nonattainment for the federal rolling 3-month average lead standard, it is designated attainment for the state lead standard (CARB 2023; EPA 2025).

Despite the current nonattainment status, air quality within the SCAB has generally improved since the inception of air pollutant monitoring in 1976. This improvement is mainly a result of lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by

SCAQMD. This trend toward cleaner air has occurred despite continued population growth. Despite this growth, air quality has improved significantly over the years, primarily because of the impacts of the region's air quality control program.

Local Ambient Air Quality

The project area's local ambient air quality is monitored by SCAQMD and CARB. CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations.

The Mission Viejo Monitoring Station located at 26081 Via Pera, Mission Viejo, California; the Anaheim Monitoring Station located at 1630 West Pampas Lane, Anaheim, California; the Anaheim Monitoring Station located at 812 West Vermont Street, Anaheim, California; and the Signal Hill Monitoring Station located at 1710 East 20th Street, Signal Hill, California, are the air quality monitoring stations most representative of the existing air quality around the project site that together provide a complete set of ambient air data. The data collected at these stations are considered representative of the air quality experienced in the project vicinity due to proximity and availability of data. Air quality data from 2021 through 2023 are provided in Table 4.3-3. The number of days exceeding the ambient air quality standards are also shown in Table 4.3-3.

Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States.

In September 2020, SCAG adopted Connect SoCal, the 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. Connect SoCal charts a path toward a more mobile, sustainable, and prosperous region by making connections between transportation networks, planning strategies, and the people whose collaboration can improve the quality of life for Southern Californians. Connect SoCal embodies a collective vision for the region's future and is developed with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses, and local interested parties within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. As stated above, SCAQMD adopted the 2022 AQMP, which incorporates these updated regional growth projections (SCAG 2020; SCAQMD 2022).

In April 2024, SCAG adopted the 2024–2050 RTP/SCS, also referred to as "Connect SoCal 2024." Connect SoCal 2024 builds upon prior planning cycles to update the vision of the region's future (SCAG 2024). The RTP/SCS is a regional growth management strategy, which targets per capita greenhouse gas (GHG) reduction from passenger vehicles and light-duty trucks in the Southern California region pursuant to Senate Bill 375. In addition to demonstrating the region's ability to attain the GHG emission reduction targets set forth by CARB, the 2024–2050 RTP/SCS outlines a series of actions and strategies for integrating the transportation network with an overall land use pattern that responds to projected growth, housing needs, changing demographics, and transportation demands (SCAG 2024). Thus, successful implementation of the 2024–2050 RTP/SCS would result in more complete communities, with various transportation and housing choices, while reducing automobile use.

Table 4.3-3. Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2021	2022	2023	2021	2022	2023
Ozone (O_3)										
Mission Viejo Monitoring Station (2021–2022); Anaheim – Pampas Lane Monitoring Station (2023)	ppm	Maximum 1-hour concentration	California	0.12	0.105	0.110	0.089	2	1	0
	ppm	Maximum 8-hour concentration	California	0.070	0.082	0.089	0.077	8	6	2
			National	0.070	0.081	0.088	0.076	8	5	2
Nitrogen Dioxide (NO_2)										
Anaheim – Vermont Street Monitoring Station	ppm	Maximum 1-hour concentration	California	0.18	0.072	0.062	0.058	0	0	0
			National	0.100	0.072	0.062	0.058	0	0	0
	ppm	Annual concentration	California	0.030	0.019	0.018	0.19	0	0	0
			National	0.053	0.019	0.019	0.20	0	0	0
Carbon Monoxide (CO)										
Mission Viejo Monitoring Station (2021–2022); Anaheim – Vermont Street Monitoring Station (2023)	ppm	Maximum 1-hour concentration	California	20	N/A	N/A	N/A	0	0	0
			National	35	1.0	1.2	2.3	0	0	0
	ppm	Maximum 8-hour concentration	California	9.0	N/A	N/A	N/A	0	0	0
			National	9	0.8	1.0	1.9	0	0	0
Sulfur Dioxide (SO_2)										
Signal Hill Monitoring Station	ppm	Maximum 1-hour concentration	National	0.075	0.059	0.061	0.023	N/A	N/A	N/A
	ppm	Maximum 24-hour concentration	National	0.14	0.013	0.015	0.052	0	0	0

Table 4.3-3. Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2021	2022	2023	2021	2022	2023
	ppm	Annual concentration	National	0.030	0.005	0.005	0.003	0	0	0
Coarse Particulate Matter (PM_{10})[a]										
Mission Viejo Monitoring Station (2021–2022); Anaheim – Pampas Lane Monitoring Station (2023)	μg/m³	Maximum 24-hour concentration	California	50	34.6	30.4	99.4	0	0	1
			National	150	35.2	31.0	97	0	0	0
	μg/m³	Annual concentration	California	20	15.8	ND	ND	ND	ND	ND
Fine Particulate Matter ($PM_{2.5}$)[a]										
Mission Viejo Monitoring Station (2021–2022); Anaheim – Pampas Lane Monitoring Station (2023)	μg/m³	Maximum 24-hour concentration	National	35	32.6	22.6	45.6	0	0	1
	μg/m³	Annual concentration	California	12	8.3	ND	ND	N/A	N/A	N/A
			National	9.0	9.3	ND	9.5	N/A	N/A	N/A

Sources: CARB 2025q; EPA 2025.
Notes: ppm = parts per million by volume; N/A = not available; μg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. The number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored.

City of Irvine General Plan

The Irvine 2045 General Plan (City of Irvine 2024a) includes various policies related to improving air quality (both directly and indirectly). Applicable goals and policies include the following:

Environmental Protection and Climate Action Element

Goal 4: Improve air quality and protect public health in Irvine by reducing air pollution and minimizing harmful emissions from various sources.

Policy A: Promote the adoption of low-emissions and alternative fuel vehicles through incentives, rebates, and infrastructure development.

Policy C: Encourage the use of clean and renewable energy sources, such as solar, wind, and geothermal, to reduce emissions from energy generation and promote a transition away from fossil fuels.

Goal 10: Continue to promote sustainable land use practices in Irvine.

Policy C: Integrate green infrastructure elements, such as parks, greenways, and open spaces, into land use planning and development projects to manage stormwater runoff, improve air and water quality, and enhance ecological connectivity and biodiversity.

Land Use Element

Goal 1: Preserve and strengthen Irvine's identity as a diverse and innovative community.

Policy B: Use building masses and landscaping to create a sense of unity throughout the City.

Policy C: Ensure energy efficiency and low maintenance needs through land use planning, building design, and landscaping design.

Policy H: Incorporate the following components in each residential planning area: a mixture of housing types and densities, a variety of public and private facilities, activity nodes; and open space areas.

City of Irvine Strategic Implementation Plan

As a part of the 2045 General Plan, the City's Strategic Implementation Plan lists goals and actionable measures to improve sustainability within the City, including measures associated with improving local air quality. Applicable policies include the following (City of Irvine 2024b):

Goal 4: Improve air quality and protect public health in Irvine by reducing air pollution and minimizing harmful emissions from various sources.

Objective EPCA-4: Achieve and maintain compliance with air quality standards set by regulatory agencies, such as the Environmental Protection Agency (EPA) and the California Air Resources Board (CARB), to ensure a healthy and sustainable environment for residents.

Policy 1: Implement measures to reduce emissions from vehicles, including promoting the use of electric vehicles (EVs), enhancing public transportation infrastructure, encouraging active transportation modes such as walking, and enforcing air quality regulations and permit requirements for businesses to ensure compliance with emission limits and standards.

Policy 2: Raise awareness about the importance of air quality and its impact on public health through educational campaigns, workshops, and community events.

An analysis of the project's potential to conflict with applicable goals and policies of the City's General Plan is included in Section 4.11, Land Use and Planning, of this EIR.

4.3.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality are based on Appendix G of the CEQA Guidelines. According to Appendix G, a significant impact related to air quality would occur if the project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. 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.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The Methodology subsection below details the specific thresholds and methodology used for each CEQA threshold.

Methodology

Threshold 1: Conflict with or Obstruction of Implementation of Applicable Air Quality Plan

Per the City's guidance and pursuant to SCAQMD's 1993 CEQA Handbook, a project would be inconsistent with the AQMP if it would:

- Contribute to an increase in frequency or severity of air quality violations; or
- Delay attainment of the California or National AAQS [CAAQS or NAAQS].

As detailed by the City in their CEQA Manual, for land use development projects, a consistency analysis with the AQMP starts with an evaluation of the land use designations on site. The regional emissions inventory for the SCAB is compiled by SCAQMD and SCAG. Regional population, housing, and employment projections developed by SCAG are based, in part, on the City's General Plan land use designations. The emissions inventory in the AQMP is based on these projections. These demographic trends are incorporated into the RTP/SCS, compiled by SCAG, to determine priority transportation projects and determine vehicle miles traveled within the SCAG region. Project-related changes in the existing population, housing, or employment growth projections may affect SCAG's demographic projections and consequently the assumptions in SCAQMD's AQMP. Per the City's adopted CEQA Manual, the project's potential to obstruct implementation of the AQMP should follow the tiered screening approach detailed below (City of Irvine 2020):

- **Tier 1:** Is the project consistent with the General Plan land use designation? If yes, the project is consistent with the AQMP; if no, proceed to Tier 2.

- **Tier 2:** Is the project a regionally significant project under SCAG's intergovernmental review criteria that could exceed regional employment, population, and housing projections within the region? If no, the project is consistent with the AQMP. This is because only projects that result in macro-level shifts in employment, population, or housing have the potential to alter the demographic projections of SCAG. If yes, proceed to Tier 3.
- **Tier 3:** Does the project generate emissions that exceed the SCAQMD regional or localized significance thresholds? If yes, the project would be inconsistent with the AQMP; if no, the project is consistent with the AQMP.

Threshold 2: Increase of Criteria Pollutant for Which Project Region is Non-attainment

By its nature, air pollution is largely a cumulative impact. However, project-level thresholds of significance for criteria pollutants are used in the determination of whether a project's individual emissions would have a cumulatively considerable contribution on air quality. If the project's emissions would exceed the applied significance thresholds, it would have a cumulatively considerable contribution. Conversely, if the emissions from development of the project would not exceed the project-specific thresholds, it is generally not considered to result in a cumulatively significant impact (SCAQMD 2003a). Accordingly, to evaluate the potential for the project to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS, this analysis applies SCAQMD's criteria pollutants thresholds.

SCAQMD has established Air Quality Significance Thresholds, as revised in March 2023, that set forth quantitative emission significance thresholds below which a project would not have a significant impact on ambient air quality under existing and cumulative conditions (SCAQMD 2023a). The quantitative air quality analysis provided herein applies the SCAQMD thresholds identified in Table 4.3-4 to determine the potential for the project to result in a significant impact under CEQA. The analysis herein therefore adheres to SCAQMD's guidelines, as recommended by the City.

Table 4.3-4. SCAQMD Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds		
Pollutant	**Construction (Pounds per Day)**	**Operation (Pounds per Day)**
VOCs	75	55
NO_x	100	55
CO	550	550
SO_x	150	150
PM_{10}	150	150
$PM_{2.5}$	55	55
Lead[a]	3	3
TACs and Odor Thresholds		
TACs[b]	Maximum incremental cancer risk ≥ 10 in 1 million Chronic and acute hazard index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Source: SCAQMD 2023a.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TAC = toxic air contaminant; SCAQMD = South Coast Air Quality Management District.
a The phaseout of leaded gasoline started in 1976. Since gasoline no longer contains lead, the project is not anticipated to result in impacts related to lead; therefore, it is not discussed in this analysis.
b TACs include carcinogens and noncarcinogens.

Construction Emissions

The California Emissions Estimator Model (CalEEMod) 2022 Version 2022.1.1.29 was used to estimate emissions from construction and operation of the project (CAPCOA 2022). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters, including the land use type used to represent the project and its size, construction schedule, and anticipated use of construction equipment, were based on information provided by the applicant/City or default model values if project specifics were unavailable.

The proposed project, which includes the development of approximately 1,360 two- and three-story attached and detached homes, extension of the Jeffrey Open Space Trail, and creation of parks, would be constructed in multiple phases over a total of 74 months from 2026 to 2032. Given the size of the proposed project, grading and implementing development activities across the project site would likely occur concurrently with multiple development areas under construction at the same time and built in response to market demands and according to logical and orderly completion of the project's streets, public utilities, and infrastructure.

Project Phasing

The project's land development, which would be completed in a single mobilization, would start with the mass grading of the project site, which is estimated to take 5 months. From start to completion, the entire land development phase, including on-site and off-site improvements, internal roadways, and the main recreational amenity/park, would take approximately 16 months. The housing would be constructed in three overlapping phases, with construction in the center of the site first (Phase 1), then construction in the southern portion of the site (Phase 2), and finally construction in the northern portion of the site (Phase 3). Phase 1 is anticipated to be approximately 29 months, Phase 2 would take approximately 46 months, and Phase 3 would be completed over 52 months. The affordable housing parcels would be ready for construction at the completion of the land development phase. The affordable housing is anticipated to be completed during Phases 2 and 3 of development, with each parcel taking approximately 24 months to complete.

Construction Details

Construction scenario details, including phase start and end date, vehicle trips (worker, haul truck, vendor truck, and on-site trucks) and equipment (type, quantity, and usage hours per day) are presented in a separate table. Tables 4.3-5 through 4.3-7 present the construction scenario details used for estimating project-generated emissions in CalEEMod. Note that the construction scenarios for Phases 1–3 are identical in the number of daily trips and equipment used per day; therefore, Table 4.3-7 reflects the scenario for all three construction phases. See Appendix B-1 for detailed construction information.

Mass grading during the land development phase would include 310,000 cubic yards of cut and 320,000 cubic yards of fill. The 10,000 net cubic yards of import material would require a total of 625 haul truck trips for export. Vendor trucks listed in earthmoving phases (i.e., Site Preparation, Grading, Utilities) represent water trucks.

Table 4.3-5. CalEEMod Construction Land Use Development Summary

CalEEMod Land Use Type	CalEEMod Land Use Subtype	Land Use Amount (Size)	Land Use Size Metric	Building Square Footage	Land Use Acreage
Residential	Single Family Housing	408	DU	1,499,880	39.22
Residential	Condos/Townhouses	612	DU	648,720	16.96
Residential	Low-Rise Apartments	340	DU	360,400	9.42
Recreational	Health Club[a]	6.68	KSF	6,680	0.15
Recreational	Swimming Pool	3.216	KSF	3,216	0.07
Parking	Other Asphalt Surfaces	16.2	Acre	N/A	16.2
Recreational	City Park	8.7	Acre	N/A	8.7

Notes: CalEEMod = California Emissions Estimator Model; DU = dwelling unit; KSF = thousand square feet; N/A not applicable.
[a] "Health Club" was the CalEEMod land use subtype used to reflect the clubhouse/amenity building.

Table 4.3-6. Land Development Phase Construction Scenario Information

Construction Phase	Start Date	End Date	Equipment					
			Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Demolition	4/6/2026	4/24/2026	20	0	10	Concrete/industrial saws	2	8
						Rubber-tired loaders	2	8
						Excavators	1	8
Mass Grading	4/20/2026	9/4/2026	30	4	14	Crawler tractors	3	8
						Tractors/loaders/backhoes	2	8
						Excavators	1	8
						Scrapers	6	8
On-Site Utilities	9/7/2026	4/2/2027	24	0	0	Excavators	2	8
						Skid steer loaders	1	8
						Tractors/loaders/backhoes	3	8
Paving	1/4/2027	2/12/2027	24	0	0	Pavers	1	8
						Rollers	1	8
						Paving equipment	2	8
						Graders	2	8
Building Construction – Amenity/Clubhouse Building	1/20/2027	9/30/2027	80	2	0	Forklifts	3	8
						Air compressors	3	8
Architectural Coating – Amenity/Clubhouse Building	6/14/2027	6/25/2027	12	2	0	Air compressors	2	8
Off-site Improvements	4/6/2026	1/8/2027	14	0	2	Excavators	1	8
						Rubber-tired loaders	2	8
Landscaping	4/5/2027	8/6/2027	20	0	2	Tractors/loaders/backhoes	2	8

Table 4.3-7. Phase 1/2/3 Construction Scenario Information

Construction Phase	Total Phase Length	Equipment					
		Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Rough Grading	Phase 1 – 4 months Phase 2 – 8 months Phase 3 – 10 months	28	4	0	Tractors/loaders/ backhoes	2	8
					Scrapers	4	8
					Plate compactors	1	8
					Graders	1	8
In-Tract Improvements (On-Site Utilities)	Phase 1 – 8 months Phase 2 – 16 months Phase 3 – 20 months	16	4	0	Excavators	2	8
					Skid steer loaders	1	8
					Tractors/loaders/ backhoes	3	8
In-Tract Paving	Phase 1 – 2 months Phase 2 – 4 months Phase 3 – 5 months	36	2	0	Pavers	1	8
					Rollers	2	8
					Scrapers	2	8
					Graders	2	8
					Rubber-tired loaders	2	8
Site Preparation and Finish Grading for Housing Construction	Phase 1 – 2 months Phase 2 – 4 months Phase 3 – 5 months	16	4	2	Tractors/loaders/ backhoes	7	8
Landscaping	Phase 1 – 6 months Phase 2 – 12 months Phase 3 – 15 months	20	0	0	Tractors/loaders/ backhoes	2	8
Building Construction (includes Architectural Coating)	Phase 1 – 23 months Phase 2 – 46 months Phase 3 – 51 months	160	2	0	Forklifts	6	8
					Air compressors	6	8

The project would be required to comply with SCAQMD Rule 403 to control dust emissions during any dust-generating activities. SCAQMD Rule 403 requires implementation of various best available fugitive dust control measures for different sources for all construction activity sources within its jurisdictional boundaries. Dust control measures include, but are not limited to, maintaining stability of soil through pre-watering of site prior to clearing, grubbing, cut and fill, and earthmoving activities; stabilizing soil during and immediately after clearing, grubbing, cut and fill, and other earthmoving activities; stabilizing backfill during handling and at completion of activity; and pre-watering material prior to truck loading and ensuring that freeboard exceeds 6 inches. While SCAQMD Rule 403 requires fugitive dust control beyond watering control measures, compliance with Rule 403 is represented in CalEEMod by assuming twice daily watering of active sites (61% reduction in PM_{10} and $PM_{2.5}$ [CAPCOA 2022]).

The project would also be required to comply with SCAQMD Rule 1113 (Architectural Coatings), which requires that the construction contractor shall procure architectural coatings that comply with the SCAQMD grams per liter VOC limits as identified by application type (paint and other finishes) to reduce associated VOC emissions.

Three separate CalEEMod runs were performed for the construction phase to address the various potential impacts evaluated herein:

1. Base CalEEMod run for mass (regional) emissions that includes all on-site and off-site sources (see Appendix B-1, CalEEMod Output Files).
2. Adjusted CalEEMod run for the localized significance threshold (LST) analysis that includes all on-site sources and only a small portion of all off-site vehicles. Because the LST analysis is focused on localized emissions of criteria air pollutants, 0.25 miles for off-site vehicle travel for worker vehicles, vendor trucks, and haul trucks trips were assumed. This is conservative as the SCAQMD LST methodology indicates that "off-site mobile emissions from the project should not be included in the emissions compared to the LSTs" (SCAQMD 2008) (see Appendix B-1).
3. Adjusted CalEEMod run for the HRA analysis that includes all on-site sources and only a small portion of diesel-fueled off-site vehicles. Because the HRA analysis is focused on localized emissions of TACs, specifically DPM, 0.25 miles for off-site vehicle travel for vendor trucks and haul trucks trips were assumed, as heavy-heavy duty trucks (typical of haul trucks) are generally diesel-fueled and medium duty trucks (typical of vendor trucks) are generally diesel- or gasoline-fueled, whereas worker trucks as generally gasoline-fueled (see Appendix B-2, Construction Health Risk Assessment).

Operations

Emissions from operation of the total buildout of the proposed project were estimated using CalEEMod Version 2022.1.1.29 for operational year 2032 representing full buildout. In addition to the total project buildout scenario, two interim operational scenarios were analyzed after completion of Phase 1 and Phase 2, respectively. These interim operational scenarios are further detailed under the "Combined Construction and Operational Emissions" header below. All three operational scenarios are listed below, with the land use information for each phase shown in Table 4.3-8:

- Phase 1 Interim Operational Phase (2029)
- Phase 2 Interim Operational Phase (2031)
- Total Project Buildout Operations (2032)

Table 4.3-8. Land Use Development Summary for the Project under the Operational Scenarios

Project Component	CalEEMod Land Use Type	Land Use Amount (Size)	Building Square Footage	Population
Phase 1 Interim Operations (2029)				
Residential	Single Family Housing	123 DU	468,713	338
Residential	Condo/Townhouses	185 DU	312,475	507
Residential	Low-Rise Apartments	103 DU	112,625	282
Recreational	City Park	16.2 Acres	0	—
Recreational	Clubhouse/Amenity Building	6.68 KSF	6,680	—
Recreational	Swimming Pools/Spa	3.22 KSF	3,216	—
Circulation	Roadways	8.7 Acres	0	—
Phase 2 Interim Operations (2031)				
Residential	Single Family Housing	260 DU	983,153	709
Residential	Condo/Townhouses	389 DU	425,228	1,063
Residential	Low-Rise Apartments	216 DU	236,238	591
Recreational	City Park	16.2 Acres	0	—
Recreational	Clubhouse/Amenity Building	6.68 KSF	6,680	—
Recreational	Swimming Pools/Spa	3.22 KSF	3,216	—
Circulation	Roadways	8.7 Acre	0	—
Full Buildout Operations (2032)				
Residential	Single Family Housing	408 DU	1,499,880	1,081
Residential	Condo/Townhouses	612 DU	648,720	1,622
Residential	Low-Rise Apartments (affordable housing)	340 DU	360,400	901
Recreational	City Park	16.2 Acres	0	—
Recreational	Amenity Building	6.68 KSF	6,680	—
Recreational	Swimming Pools/Spa	3.22 KSF	3,216	—
Circulation	Roadways	8.7 Acres	0	—

Source: Appendix B-1.
Notes: CalEEMod = California Emissions Estimator Model; DU = dwelling unit; KSF = 1,000 square feet.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2022). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential and nonresidential buildings and on the default factor of pounds of VOCs per building square foot per day. For parking lot land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a square footage of parking surface area and pounds of VOCs per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of residential and nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. For the unmitigated scenario, CalEEMod assumes a default value of 50 grams/liter of residential interior and exterior paints, and 100 grams/liter of nonresidential interior and exterior VOCs, and 100 grams/liter for parking lot paint VOCs. The model default reapplication rate of 10% of area per year is used. Consistent with CalEEMod default values, the residential surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For nonresidential land uses (e.g., recreational amenities), CalEEMod default values indicate that the surface area for painting equals 2.0 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per residential dwelling unit per day and grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days (CAPCOA 2022).

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

As described in Section 4.3.4, Project Design Features, through incorporation of PDF-AQ/GHG-1, All-Electric Residential Development, into the project design, the project is committed to all-electric appliances within residences; therefore, the project would only include natural gas use for the nonresidential land uses (recreational amenity building and associated swimming pools/spa). CalEEMod default values for energy consumption for each land use were applied for the project analysis. The energy use from residential land uses is calculated in CalEEMod based on the Residential Appliance Saturation Survey. The energy use from nonresidential land uses is calculated in CalEEMod based on the California Commercial End-Use Survey database, with the exception of the natural gas energy associated with the recreational pools, which was calculated outside of CalEEMod based on a Southern California Edison study analyzing the average pool heater size.

Mobile Sources

Mobile sources for the proposed project would be motor vehicles (i.e., automobiles and light-duty trucks) traveling to and from the project site. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. Trip generation rates match the proposed project's trip generation rates presented in the project's Comprehensive Traffic Study by LSA (Appendix I). CalEEMod default data, including emissions factors, were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources. Emission factors representing the vehicle mix and emissions for 2032 were used to estimate emissions associated with full buildout of the proposed project.

Combined Construction and Operational Emissions

Project construction would be phased, with the first phase being land development of the site, including mass grading, utilities, and the construction of park areas and internal roadways, as well as off-site improvements. Following land development, the residential parcels would be developed in three overlapping phases. Construction of Phase 1 is anticipated to conclude in 2029, and Phase 2 construction would conclude in 2031. Because the residential units constructed during Phase 1 would be operational in 2029 (and Phase 2 in 2031), there would be an overlap of construction and operation for the project. To capture the overlapping emissions, two interim scenarios were analyzed. The Phase 1 interim scenario in 2029, following the completion of Phase 1 construction, would represent emissions from the operation of Phase 1 residential units and the construction of Phase 2. The Phase 2 interim scenario in 2031, following the completion of Phase 2 construction, would represent emissions from the operation of Phase 2 residential units and the construction of Phase 3. The operational emissions would increase from 2029 through 2032 as more dwelling units become operational. While not established in written SCAQMD guidance including the 1993 Air Quality Handbook or the City's thresholds, SCAQMD has recommended a calculation of combined construction and operational emissions, which is provided herein.

Threshold 3: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

The potential for the project to expose receptors to substantial pollutant concentrations includes an LST analysis, a quantitative construction HRA, and a qualitative CO hotspot analysis.

Localized Significance Thresholds

In addition to the above-listed regional emission-based thresholds, the City's guidance reflects SCAQMD's recommendation to evaluate localized air quality impacts to sensitive receptors in the immediate vicinity of the proposed project as a result of construction activities (City of Irvine 2020). Such an evaluation is referred to as an LST analysis. For project sites of 5 acres or less, SCAQMD LST Methodology (SCAQMD 2008) includes lookup tables that can be used to determine the maximum allowable daily emissions that would satisfy the localized significance criteria (i.e., the emissions would not cause an exceedance of the applicable concentration limits for NO_2, CO, PM_{10}, and $PM_{2.5}$) without performing project-specific dispersion modeling.

The LST significance thresholds for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of a project that would not cause or contribute to an exceedance of the relevant ambient air quality standards, while the threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust). The LST significance threshold for $PM_{2.5}$ is intended to ensure that construction emissions do not contribute substantially to existing exceedances of the $PM_{2.5}$ ambient air quality standards. The allowable emission rates depend on the following parameters:

- Source-receptor area in which the project is located
- Size of the project site
- Distance between the project site and the nearest receptor (any areas where persons can be situated for an hour or longer at a time)

The project site is located in Source-Receptor Area 20 (Central Orange County Coastal). The SCAQMD provides guidance for applying CalEEMod to the LSTs. LST pollutant screening level concentration data are currently published for 1-, 2-, and 5-acre sites for varying distances. The maximum number of acres disturbed on the peak day was estimated using the Fact Sheet for Applying CalEEMod to Localized Significance Thresholds (SCAQMD 2014). During grading activities, fugitive dust can be generated from the movement of dirt on the project site. CalEEMod estimates dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading dirt into haul trucks. Each of those activities is calculated differently in CalEEMod, based on the number of acres traversed by the grading equipment. Only some pieces of equipment generate fugitive dust in CalEEMod. The CalEEMod manual identifies various equipment and the acreage disturbed in an 8-hour day. For example:

- Crawler tractors, graders, and rubber-tired dozers: 0.5 acres per 8-hour day
- Scrapers: 1 acre per 8-hour day

The LST lookup tables that can be used to determine the maximum allowable daily emissions are provided at increments of 1 acre, 2 acres, and 5 acres. Based on the number of crawler tractors and scrapers during the mass grading phase and using the Fact Sheet for Applying CalEEMod to Localized Significance Thresholds guidance described above, the project site was calculated to use a 5-acre site LST for the LST analysis. Therefore, the analysis applies the LSTs for a 5-acre disturbance area, which is presented in Table 4.3-9.

The LST values from the SCAQMD lookup tables for Source-Receptor Area 20 (Central Orange County Coastal) are shown in Table 4.3-9.

Table 4.3-9. Localized Significance Thresholds for Source-Receptor Area 20

Pollutant	Threshold by Acres Disturbed per Day (Pounds per Day)
Localized Significance Thresholds for Peak Construction	
NO_2	197
CO	1,711
PM_{10}	14
$PM_{2.5}$	9

Source: SCAQMD 2008.
Notes: NO_2 = nitrogen dioxide; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
For all pollutants, localized significance thresholds were determined based on the values for a distance of 25 meters (82 feet) from the nearest receptor for a disturbed acreage of 5 acres.

Per the SCAQMD's Finalized LST Methodology, locations that an individual could remain for 24 hours (i.e., a residence, hospital, convalescent facility, hotel, etc.) should be considered to determine the threshold for PM_{10} and $PM_{2.5}$ (SCAQMD 2008). The closest off-site receptors to the project site's construction activity are single-family residences southwest of the project site. However, because of the nature of project buildout, there would be an overlap of phasing between construction and operational phases of the project. Therefore, the closest receptor to the project site's construction during peak activity would be on-site receptors located in the newly built residences during Phase 1. The minimum recommended distance of 25 meters has been used to determine LST receptor distance for emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$. Emissions from peak construction (during construction of Phase 2 residences) are compared to LSTs for the on-site residential construction activities and represent the most conservative emissions, as construction activities at further distances would result in lower emissions due to increased distances. Based on equipment projections, the analysis applies the LSTs for a 5-acre disturbance area, which is presented in Table 4.3-9.

Construction Health Risk Assessment

A construction HRA was performed to evaluate potential health risk associated with TACs from construction of the proposed project. The HRA includes both off-site and on-site analyses as residential occupation is estimated to occur while construction will continue for the remainder of the project construction. The following discussion summarizes the dispersion modeling and HRA methodology.

The dispersion modeling of DPM was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), which is the model SCAQMD requires for atmospheric dispersion of emissions. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of surface and elevated sources, building downwash, and simple and complex terrain. For the proposed project, AERMOD was run with all sources emitting unit emissions (1 gram per second) to obtain the "X/Q" values. X/Q is a dispersion factor that is the average effluent concentration normalized by source strength and is used as a way to simplify the representation of emissions from many sources. The X/Q values of ground-level concentrations were determined for construction emissions using AERMOD and the maximum concentrations determined for the 1-hour and period averaging times. For the off-site analysis, sensitive receptor exposure was assumed for the entire construction schedule, approximately 6.3 years, and includes both on-site and off-site improvements. The on-site exposure assessment was assumed to conservatively start with Year 2029 construction and include emissions through the end of construction approximately 3.6 years. Principal parameters of the modeling are presented in Table 4.3-10.

Table 4.3-10. AERMOD Principal Parameters

Parameter	Details
Meteorological Data	The latest 5-year meteorological data for the John Wayne Airport station from SCAQMD were downloaded and then input into AERMOD.
Urban versus Rural Option	The urban dispersion option was selected and Orange County population for year 2023 (3,135,755 persons) was input into AERMOD.
Terrain Characteristics	Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate. Per SCAQMD guidance, the National Elevation Dataset data set with resolution of 1 arc-second was used.
Emission Sources and Release Parameters	A volume source was used to model the construction scenario. The release parameter was obtained from similar equipment.
Source Release Characterizations	Air dispersion modeling of DPM emissions was conducted assuming the equipment would operate in accordance with the modeling scenario estimated in CalEEMod (Appendix B-1). The construction equipment for on-site and off-site improvements and on-site truck travel DPM emissions were modeled as a line of adjacent volume sources across the project site to represent project construction with a release height of 5 meters, a plume height of 10 meters, and a plume width of 8 meters.
Discrete Receptors	The HRA evaluates the risk to existing residential receptors located in proximity to the project as well as on-site receptors that would be occupied prior to the end of construction. For the off-site analysis, a nested grid of receptors was utilized with 50-meter spacing out to a distance of 1,000 feet, 100-meter spacing to 2,000 meters, and 250-meter spacing to 5,000 meters from the project area was placed over a residential development to the surrounding of the project site. For the on-site analysis, receptors were placed at 50-meter spacing within the area to be occupied while construction remains.

Source: Appendix B-2.
Note: AERMOD = American Meteorological Society/Environmental Protection Agency Regulatory Model.

Dispersion model plotfiles from AERMOD were then imported into CARB's HARP2 to determine health risk, which requires peak 1-hour emission rates and annual-averaged emission rates for all pollutants for each modeling source. For the residential health risk, the HRA assumes exposure would start in the third trimester of pregnancy.

Carbon Monoxide Hotspots

Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. Localized areas where ambient concentrations exceed federal and/or state standards for CO are termed “CO hotspots.” The transport of CO is extremely limited, as it disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthy levels, affecting sensitive receptors. The assessment of the potential for the project to result in a CO hotspot is based on comparison to the SCAQMD 2003 AQMP CO hotspot analysis.

Threshold 4: Other Emissions Such as Odors

The potential for the project to result in other emissions, specifically an odor impact (CEQA Guidelines, Appendix G, Threshold 4), is based on the project’s anticipated construction activity, land use types, and the potential for the project to create an odor nuisance pursuant to SCAQMD Rule 402.

4.3.4 Project Design Features

The project design would incorporate the following PDFs to reduce criteria air pollutant emissions. The project would also implement PDFs that reduce other potential environmental impacts and thereby achieve direct or indirect air quality, GHG emissions, and energy co-benefits.

PDF-AQ/GHG-1 All-Electric Residential Development. All proposed residential development would use all-electric appliances and end uses (including heating, ventilation, and air conditioning; water heating; and induction cooking).

PDF-AQ/GHG-2 Energy Efficient Appliances Within Residential Development. During construction activities, the project applicant or its designee would install ENERGY STAR®–rated appliances within the residential land uses, including but not limited to refrigerators, dishwashers, clothes washers, and ceiling fans.

PDF-AQ/GHG-3 Exceedance of Title 24, Part 6 Standards. The project would exceed the requirements of the 2022 California Code of Regulations Title 24, Part 6, Building Energy Efficiency Standards by 10%.

4.3.5 Impacts Analysis

1. Would the project conflict with or obstruct implementation of the applicable air quality plan?

Significant and Unavoidable Impact. As previously discussed, the project is located within the SCAB under the jurisdiction of SCAQMD, which is the local agency responsible for administration and enforcement of air quality regulations for the area.

SCAQMD has established criteria for determining consistency with the AQMP, currently the 2022 AQMP, in Chapter 12, Sections 12.2 and 12.3, in the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993). As discussed in Section 4.3.3, Thresholds of Significance, the City, in its CEQA Manual, includes its own guidance for project consistency with the SCAQMD AQMP (City of Irvine 2020), including the following tiered screening approach:

- Tier 1: Is the project consistent with the General Plan land use designation? If yes, the project is consistent with the AQMP; if no, proceed to Tier 2.
- Tier 2: Is the project a regionally significant project under SCAG's intergovernmental review criteria that could exceed regional employment, population, and housing projections within the region? If no, the project is consistent with the AQMP. This is because only projects that result in macro-level shifts in employment, population, or housing have the potential to alter the demographic projections of SCAG. If yes, proceed to Tier 3
- Tier 3: Does the project generate emissions that exceed the SCAQMD regional or localized significance thresholds? If yes, the project would be inconsistent with the AQMP; if no, the project is consistent with the AQMP.

Addressing Tier 1, the current General Plan designation for the project site is Recreation. Therefore, the project would require a General Plan Amendment to change the land use designation on the site to Medium Density and Medium High Density Residential. As such, the General Plan Amendment would result in residential units at the project site; therefore, the project is not consistent with the General Plan land use designation, and the consistency analysis would proceed to Tier 2.

Regarding Tier 2, SCAG relies on the definition of a project of regional significance stated in CEQA Section 15206. CEQA Section 15206 determines that a project is of regional significance if it meets any of the criteria described therein, including if a project has more than 500 dwelling units. A project that meets any of the criteria qualify as "a project [that] has the potential for causing significant effects on the environment extending beyond the city or county in which the project would be located… [such as] generating significant amounts of traffic or interfering with the attainment or maintenance of state or national air quality standards." The project proposes approximately 1,360 total dwelling units, which designates the project as with the potential to affect the environment extending beyond the City or County. Therefore, the project would be a regionally significant project under SCAG's review criteria that could exceed regional employment, population, and housing projections within the region, and the consistency analysis would proceed to Tier 3.

Addressing Tier 3, Section 4.3.5(2) includes quantification of the criteria air pollutant emissions generated by the proposed project and applies the SCAQMD mass daily construction and operational thresholds to evaluate the project's potential impacts with regards to cumulatively considerable net increase of a nonattainment criteria pollutant. As discussed below, emissions resulting from project construction would be below SCAQMD mass daily construction thresholds after inclusion of Mitigation Measure (MM) AQ-1 through MM-AQ-8, as shown in Table 4.13-11 and Table 4.3-12 (refer to Section 4.3.6 for the text of all mitigation measures specifically for air quality). However, criteria air pollutant emissions resulting from project operation would exceed the criteria pollutant thresholds established by SCAQMD for VOC emissions, as demonstrated in Table 4.3-13. Even with implementation of all applicable mitigation measures, the project would exceed the mass daily regional operational thresholds. As such, the project's criteria air pollutant emissions would be significant and unavoidable, as detailed in Section 4.3.5(2), and the project would have the potential to increase the frequency or severity of a violation in the federal or state ambient air quality. Because the project would generate emissions that exceed the SCAQMD regional thresholds, the project would be inconsistent with the AQMP. Because the project would be inconsistent with the AQMP, according to the City's tiered approach, the project would conflict with the applicable air quality plan, resulting in a significant and unavoidable impact.

2. ***Would the project 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?***

Construction Emissions

Less-Than-Significant Impact with Mitigation Incorporated. Proposed construction activities would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing from architectural coatings and asphalt pavement application) and off-site sources (i.e., on-road haul trucks, delivery trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Therefore, such emissions levels can only be estimated, with a corresponding uncertainty in precise ambient air quality impacts.

As discussed in Section 4.3.3, criteria air pollutant emissions associated with temporary construction activity were quantified using CalEEMod based on the construction information presented in Tables 4.3-5 through 4.3-7.

Implementation of the project would generate criteria air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The project will be required to comply with SCAQMD Rule 403 to control dust emissions generated during the grading activities. Standard construction practices that were assumed to be employed to reduce fugitive dust emissions, and were quantified in CalEEMod, include watering of the active sites three times per day depending on weather conditions. Internal combustion engines used by construction equipment, haul trucks, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions; however, the contractor will be required to procure architectural coatings from a supplier in compliance with the requirements of SCAQMD Rule 1113 (Architectural Coatings).

Construction emissions were calculated for the estimated worst-case day over the construction period associated with each phase and reported as the maximum daily emissions estimated during each year of construction (2026 through 2032). Table 4.3-11 presents the estimated maximum daily construction emissions generated during construction of the project. "Summer" emissions are representative of the conditions that may occur during the O_3 season (May 1 to October 31), and "winter" emissions are representative of the conditions that may occur during the balance of the year (November 1 to April 30). Details of the emission calculations are provided in Appendix B-1.

Table 4.3-11. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Maximum Pounds Per Day					
Summer						
2026	6.92	59.89	67.90	0.16	7.04	2.97
2027	44.78	81.16	154.89	0.19	14.72	5.00
2028	59.49	160.12	278.77	0.42	25.72	9.11
2029	59.10	118.56	231.63	0.31	18.12	6.64
2030	40.33	89.62	184.13	0.23	17.33	5.31
2031	10.44	29.34	63.93	0.07	6.85	1.97
2032	6.04	19.11	41.95	0.05	4.53	1.28
Winter						
2026	5.25	45.31	59.28	0.12	4.71	2.05
2027	34.74	89.75	163.74	0.21	13.74	5.23
2028	60.89	139.78	259.14	0.35	21.05	7.88
2029	23.42	106.00	179.63	0.30	18.54	6.08
2030	37.49	80.48	157.63	0.21	15.38	4.80
2031	16.67	50.79	106.61	0.12	11.72	3.38
2032	6.04	19.26	40.29	0.05	4.53	1.28
Maximum Daily Emissions (Summer or Winter)	**60.89**	**160.12**	**278.77**	**0.42**	**25.72**	**9.11**
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Source: Appendix B-1.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD= South Coast Air Quality Management District.

As shown in Table 4.3-11, although construction-related VOC, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions would not exceed the SCAQMD thresholds during construction, the project would exceed the SCAQMD mass daily thresholds for NO_x during construction. Therefore, impacts related to exceedance of SCAQMD mass daily regional thresholds during construction of the project would be potentially significant, and mitigation is required.

As provided in detail in Section 4.3.6, Mitigation Measures, Mitigation Measure (MM) AQ-1 through MM-AQ-4 would be required to reduce criteria air pollutant emissions during project construction. MM-AQ-1 (Construction Equipment Exhaust Minimization) would require the use of Tier 4 Final construction equipment for off-road equipment over 25 horsepower. MM-AQ-2 (Additional Construction Equipment Emission Reductions) would require additional equipment reductions through the use of alternatively fueled equipment over 25 horsepower where commercially available. MM-AQ-3 (Use of Super-Compliant Low-VOC Paint During Construction) would require the use of low-VOC architectural coatings during construction. Finally, MM-AQ-4 (Limit Truck and Equipment Idling During Construction) would require truck and equipment to be shut off when not in use and limit idling time during construction to 3 minutes.

Implementation of MM-AQ-2 and MM-AQ-4 would reduce emissions from construction; however, these mitigation measures are not quantified in the construction analysis and are therefore not reflected in Table 4.3-12. Details of the emission calculations are provided in Appendix B-1. It should be noted that while implementation of MM-AQ-3 is not required to reduce VOC emissions to less than significant regarding mass daily regional construction emissions, the emission reductions are quantified in Table 4.3-12 because MM-AQ-3 is necessary to reduce emissions under the combined construction and operational assessment presented in Table 4.3-15 of this section.

Table 4.3-12 presents the estimated maximum daily construction emissions generated during construction of the project with incorporation of the quantified MM-AQ-1 and MM-AQ-3.

Table 4.3-12. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Maximum Pounds Per Day					
Summer						
2026	1.81	14.16	92.17	0.16	4.90	1.02
2027	38.01	37.91	159.72	0.19	12.89	3.24
2028	48.39	61.46	315.15	0.42	21.36	5.17
2029	48.40	53.58	246.87	0.31	15.58	4.02
2030	32.41	45.05	189.58	0.23	15.58	3.73
2031	7.89	18.02	61.27	0.07	6.44	1.59
2032	4.40	11.87	40.24	0.05	4.29	1.06
Winter						
2026	1.58	12.45	76.81	0.12	3.24	0.72
2027	26.67	40.02	170.02	0.21	11.20	2.93
2028	48.34	61.33	273.39	0.35	17.42	4.59
2029	15.03	41.23	208.97	0.30	15.92	3.71
2030	30.46	41.67	163.95	0.21	13.70	3.29
2031	12.31	30.41	102.41	0.12	11.00	2.73
2032	4.40	12.02	38.57	0.05	4.29	1.06
Maximum Daily Emissions (Summer or Winter)	**48.39**	**61.46**	**315.15**	**0.42**	**21.36**	**5.17**
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: See Appendix B-1 for complete results.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD= South Coast Air Quality Management District.
This analysis includes quantification of PDF-AQ/GHG-1 (All-Electric Residential Development), PDF-AQ/GHG-2 (Energy Efficient Appliances Within Residential Development), MM-AQ-1 (Construction Equipment Exhaust Minimization), and MM-AQ-3 (Use of Super-Compliant Low-VOC Paint During Construction).

Based on the emissions indicated in Table 4.3-12, after implementation of MM-AQ-1 to reduce NO_x emissions, regional construction emissions would not exceed the applicable SCAQMD thresholds of significance for any criteria pollutant.

Operational Emissions

Significant and Unavoidable Impact. Operation of the project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources, including vehicular traffic generated by residents, employees, customers, and visitors; energy sources from natural gas usage; area sources, including the use of landscaping equipment, consumer products, and hearths; and architectural coatings. As detailed in Section 4.3.3, pollutant emissions associated with long-term operations were quantified using CalEEMod using a combination of project-specific information and CalEEMod default values.

Table 4.3-13 compares the unmitigated maximum daily area, energy, and mobile source emissions associated with project operation (2032) to SCAQMD thresholds. Table 4.3-13 emissions include implementation of PDF-AQ/GHG-1 (All-Electric Residential Development) and PDF-AQ/GHG-2 (Energy Efficient Appliances Within Residential Development). Details of the emission calculations are provided in Appendix B-1.

Table 4.3-13. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions – Unmitigated

Emissions Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Project Buildout						
Summer						
Mobile	26.28	15.51	195.40	0.53	56.04	14.40
Area	65.33	0.72	77.79	0.00	0.04	0.03
Energy	0.12	2.16	1.81	0.01	0.16	0.16
Total Daily Summer Emissions	*91.73*	*18.38*	*275.00*	*0.55*	*56.24*	*14.59*
Winter						
Mobile	26.16	16.83	183.75	0.51	56.04	14.40
Area	58.61	0.00	0.00	0.00	0.00	0.00
Energy	0.12	2.16	1.81	0.01	0.16	0.16
Total Daily Winter Emissions	*84.89*	*18.99*	*185.56*	*0.53*	*56.20*	*14.57*
Maximum Daily Emissions (Summer or Winter)	**91.73**	**18.99**	**275.00**	**0.55**	**56.24**	**14.59**
SCAQMD Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**Yes**	**No**	**No**	**No**	**No**	**No**

Source: See Appendix B-1 for complete results.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
Emissions reflect operations including the implementation of PDF-AQ/GHG-1 and PDF-AQ/GHG-2.

As shown in Table 4.3-13, although NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions would not exceed the SCAQMD thresholds during operations, the project would exceed the SCAQMD mass daily thresholds for VOC during operations. Therefore, mitigation is required to reduce impacts to less than significant.

To reduce VOC emissions during operation, the project would implement MM-AQ-5 (Low-VOC Cleaning Supplies and Paint Educational Program) and MM-AQ-6 (Use of Low-VOC Cleaning Supplies and Paint for Spaces Operated by Homeowner's Association), although these mitigation measures are not quantified in the operations analysis. Moreover, while not quantified, MM-AQ-7 (Use of Zero-Emission Landscape Equipment for Homeowner's Association Land), MM-AQ-8 (Landscape Maintenance Equipment Emission Reduction), and MM-GHG-1 (Installation of Additional Electric Vehicle Chargers Beyond Title 24 Compliance) would also be applicable to reduce operational emissions.

As discussed in Section 4.3.2, Relevant Plans, Policies, and Ordinances, the SCAB has been designated as a national nonattainment area for O_3 and $PM_{2.5}$, and a California nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. The nonattainment status is the result of cumulative emissions from various sources of air pollutants and their precursors within the SCAB, including motor vehicles, off-road equipment, and commercial and industrial facilities. Construction and operation of the project would generate VOC and NO_x emissions (which are precursors to O_3) and emissions of PM_{10} and $PM_{2.5}$. Because the project-generated operational emissions of VOC would exceed the SCAQMD thresholds, the project would result in potentially significant impact regarding a cumulatively considerable increase in emissions of nonattainment pollutants. The VOC emissions during operation of the proposed project are primarily a result of the area source emissions. Area source emissions of VOCs are a result of the anticipated use of consumer products by residents, reapplication of architectural coating over the life of the project and from the use of landscaping equipment. MM-AQ-5 through MM-AQ-8 would be implemented to reduce VOC emissions related to consumer products, architectural coatings, and landscape equipment. However, requiring that residents use low-VOC consumer products or limiting the VOC content of paints within residents' homes cannot be enforced. MM-AQ-5 through MM-AQ-8 would encourage these reductions but cannot guarantee that VOC emissions would be reduced below the SCAQMD's daily threshold. Because operational VOC emissions cannot feasibly be reduced to less than the applicable VOC threshold during operations, the project would exceed the mass daily regional operational thresholds even with implementation of all feasible mitigation.

Overlap of Construction and Operation

Significant and Unavoidable Impact. During project development, project construction activities would occur concurrently with partial project operation. Phase 1 would be operational in 2029 while Phase 2 and Phase 3 are being constructed; furthermore, Phase 2 would be operational in 2031 while Phase 3 is being constructed. Although it is not established in written SCAQMD guidance, including the 1993 Air Quality Handbook and the 2023 thresholds, a calculation of combined construction and operational emissions has been recommended by SCAQMD. Therefore, as recommended by SCAQMD, a calculation of combined construction and operational emissions is provided herein (Table 4.3-14). Table 4.3-14 presents the overlapping emissions of construction and operation under summer and winter conditions for each interim operation scenario prior to implementation of mitigation measures. Table 4.3-14 includes quantification of PDF-AQ/GHG-1 (All-Electric Residential Development) and PDF-AQ/GHG-2 (Energy Efficient Appliances Within Residential Development).

Table 4.3-14. Estimated Maximum Daily Concurrent Construction and Operational Criteria Air Pollutant Emissions – Unmitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Maximum Pounds Per Day					
Summer						
2029						
2029 Construction	59.10	118.56	231.63	0.31	18.12	6.64
Phase 1 Operation	29.70	7.78	89.92	0.18	17.14	4.54
Total	**88.79**	**126.34**	**321.55**	**0.49**	**35.26**	**11.18**
2031						
2031 Construction	10.44	29.34	63.93	0.07	6.85	10.44
Phase 1 + 2 Operation	60.23	12.93	178.95	0.36	35.87	9.36
Total	**70.67**	**42.27**	**242.88**	**0.43**	**42.72**	**11.33**
Winter						
2029						
2029 Construction	23.42	106.00	179.63	0.30	18.54	6.08
Phase 1 Operation	27.57	8.02	62.57	0.18	17.12	4.53
Total	**50.99**	**114.02**	**242.20**	**0.47**	**35.67**	**10.61**
2031						
2031 Construction	16.67	50.79	106.61	0.12	11.72	3.38
Phase 1 + 2 Operation	55.85	13.35	121.85	0.34	35.85	9.34
Total	**72.53**	**64.14**	**228.46**	**0.46**	**47.57**	**12.72**
Maximum Daily Emissions (Summer or Winter)	**88.79**	**126.34**	**321.55**	**0.49**	**35.67**	**12.72**
SCAQMD Mass Daily Regional Operational Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**Yes**	**Yes**	**No**	**No**	**No**	**No**

Source: See Appendix B-1 for complete results.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
Emissions reflect operations including the implementation of PDF-AQ/GHG-1 and PDF-AQ/GHG-2.

As shown in Table 4.3-14, the combined construction and operations scenario for 2029 and 2031 would exceed the SCAQMD daily significance operational thresholds for VOC and NO_x prior to mitigation during construction activities, and therefore, the concurrent project construction and operational activities would result in emissions that would exceed the SCAQMD thresholds and result in a potentially significant impact under the 2029 and 2031 interim scenario. Several mitigation measures have been identified that would reduce the project's operational criteria air pollutant emissions to the extent feasible (see MM-AQ-5 through MM-AQ-8 and MM-GHG-1). The mitigation measures would reduce VOC emissions attributable to cleaning supplies and architectural coatings, reduce emissions attributable to the use of landscaping equipment, and reduce emissions from diesel vehicle trips by installing electric vehicle chargers. However, the emission reduction benefits of these mitigation measures are not readily quantifiable, and thus, mitigated emissions are not presented herein. Further, the magnitude of emission reductions attributable to these mitigation measures is not expected to reduce the project's operational emissions below SCAQMD's numerical thresholds of significance, as the emission exceedances are primarily attributable to mobile sources (i.e., vehicles).

Table 4.3-15 provides the maximum construction and operational emissions combined in 2029 and 2031, including quantified reductions from implementation of PDF-AQ/GHG-1, PDF-AQ/GHG-2, MM-AQ-1 (Construction Equipment Exhaust Minimization), and MM-AQ-3 (Use of Super-Compliant Low-VOC Paint During Construction). Moreover, although not quantified in Table 4.3-15, MM-AQ-2 (Additional Construction Equipment Emission Reductions), MM-AQ-4 (Limit Truck and Equipment Idling During Construction), MM-AQ-5 (Low-VOC Cleaning Supplies and Paint Educational Program), MM-AQ-6 (Use of Low-VOC Cleaning Supplies and Paint for Spaces Operated by Homeowner's Association), MM-AQ-7 (Use of Zero-Emission Landscape Equipment for Homeowner's Association Land), MM-AQ-8 (Landscape Maintenance Equipment Emission Reduction), and MM-GHG-1 (Installation of Additional Electric Vehicle Chargers Beyond Title 24 Compliance) would also be applicable to reduce construction and operational emissions.

Table 4.3-15. Estimated Maximum Daily Concurrent Construction and Operational Criteria Air Pollutant Emissions – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Maximum Pounds Per Day					
Summer						
2029						
2029 Construction	48.40	53.58	246.87	0.31	15.58	4.02
Phase 1 Operation	29.70	7.78	89.92	0.18	17.14	4.54
Total	**78.09**	**61.36**	**336.79**	**0.49**	**32.71**	**8.56**
2031						
2031 Construction	7.89	18.02	61.27	0.07	6.44	1.59
Phase 1 + 2 Operation	60.23	12.93	178.95	0.36	35.87	9.36
Total	**68.13**	**30.95**	**240.23**	**0.43**	**42.31**	**10.95**
Winter						
2029						
2029 Construction	15.03	41.23	208.97	0.30	15.92	3.71
Phase 1 Operation	27.57	8.02	62.57	0.18	17.12	4.53
Total	**42.60**	**49.25**	**271.54**	**0.47**	**33.04**	**8.24**
2031						
2031 Construction	12.31	30.41	102.41	0.12	11.00	2.73
Phase 1 + 2 Operation	55.85	13.35	121.85	0.34	35.85	9.34
Total	**68.17**	**43.76**	**224.27**	**0.46**	**46.85**	**12.07**
Maximum Daily Emissions (Summer or Winter)	**78.09**	**61.36**	**336.79**	**0.49**	**46.85**	**12.07**

Table 4.3-15. Estimated Maximum Daily Concurrent Construction and Operational Criteria Air Pollutant Emissions – Mitigated

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Maximum Pounds Per Day					
SCAQMD Mass Daily Regional Operational Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**Yes**	**Yes**	**No**	**No**	**No**	**No**

Source: See Appendix B-1 for complete results.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
Emissions reflect operations including the implementation of PDF-AQ/GHG-1 and PDF-AQ-2; emissions reflect construction mitigation including MM-AQ-1 and MM-AQ-3.

As shown in Table 4.3-15, overlapping emissions from the interim operational scenarios in 2029 and 2031 would exceed the numerical thresholds of significance established by the SCAQMD for emissions of VOCs and NO_x, even with the incorporation of all quantifiable mitigation measures.

Health Effects of Criteria Pollutants

The California Supreme Court's *Sierra Club v. County of Fresno* (2018) 6 Cal. 5th 502 decision (referred to herein as the Friant Ranch decision) (issued on December 24, 2018) addresses the need to correlate mass emission values for criteria air pollutants to specific health consequences and contains the following direction from the California Supreme Court: "The Environmental Impact Report (EIR) must provide an adequate analysis to inform the public how its bare numbers translate to create potential adverse impacts or it must explain what the agency *does* know and why, given existing scientific constraints, it cannot translate potential health impacts further" (italics original).

Currently, SCAQMD, CARB, and EPA have not approved a quantitative method to reliably, meaningfully, and consistently translate the mass emission estimates for the criteria air pollutants resulting from the project to specific health effects. In addition, there are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days.

In connection with the judicial proceedings culminating in issuance of the Friant Ranch decision, the SCAQMD and the San Joaquin Valley Air Pollution Control District (SJVAPCD) filed amicus briefs attesting to the extreme difficulty of correlating an individual project's criteria air pollutant emissions to specific health impacts. Both SJVAPCD and SCAQMD have among the most sophisticated air quality modeling and health impact evaluation capabilities of the air districts in California. The key relevant points from SCAQMD and SJVAPCD briefs is summarized herein.

In requiring a health impact type of analysis for criteria air pollutants, it is important to understand how O_3 and PM are formed, dispersed, and regulated. The formation of O_3 and PM in the atmosphere, as secondary pollutants,[4] involves complex chemical and physical interactions of multiple pollutants from natural and anthropogenic sources. The O_3 reaction is self-perpetuating (or catalytic) in the presence of sunlight because NO_2 is photochemically reformed from nitric oxide. In this way, O_3 is controlled by both NO_x and

4 Air pollutants formed through chemical reactions in the atmosphere are referred to as secondary pollutants.

VOC emissions (NRC 2005). The complexity of these interacting cycles of pollutants means that incremental decreases in one emission may not result in proportional decreases in O_3 (NRC 2005). Although these reactions and interactions are well understood, variability in emission source operations and meteorology creates uncertainty in the modeled O_3 concentrations to which downwind populations may be exposed (NRC 2005). Once formed, O_3 can be transported long distances by wind, and due to atmospheric transport, contributions of precursors from the surrounding region can also be important (EPA 2008). Because of the complexity of O_3 formation, a specific tonnage of VOCs or NO_x emitted in a particular area does not equate to a particular concentration of O_3 in that area (SJVAPCD 2015). PM can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, like O_3, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as SO_x and NO_x (SJVAPCD 2015). Because of the complexity of secondary PM formation, including the potential to be transported long distances by wind, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area (SJVAPCD 2015). This is especially true for individual projects, like the project, where project-generated criteria air pollutant emissions are not derived from a single "point source," but from construction equipment and mobile sources (passenger cars and trucks) driving to, from, and around the project site.

Another important technical nuance is that health effects from air pollutants are related to the concentration of the air pollutant that an individual is exposed to, not necessarily the individual mass quantity of emissions associated with an individual project. For example, health effects from O_3 are correlated with increases in the ambient level of O_3 in the air a person breathes (SCAQMD 2015). However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels over an entire region (SCAQMD 2015). The lack of link between the tonnage of precursor pollutants and the concentration of O_3 and $PM_{2.5}$ formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects; rather, it is the concentration of resulting O_3 that causes these effects (SJVAPCD 2015). Indeed, the ambient air quality standards, which are statutorily required to be set by EPA at levels that are requisite to protect the public health, are established as concentrations of O_3 and $PM_{2.5}$ and not as tonnages of their precursor pollutants (SJVAPCD 2015). Because the ambient air quality standards are focused on achieving a particular concentration regionwide, the tools and plans for attaining the ambient air quality standards are regional in nature. For CEQA analyses, project-generated emissions are typically estimated in pounds per day or tons per year and compared to mass daily or annual emission thresholds. CEQA thresholds are established at levels that the air basin can accommodate without affecting the attainment date for the ambient air quality standards; however, even if a project exceeds established CEQA significance thresholds, this does not mean that one can easily determine the concentration of O_3 or PM that will be created at or near the project site on a particular day or month of the year or what specific health impacts will occur (SJVAPCD 2015).

In regard to regional concentrations and air basin attainment, the SJVAPCD emphasized that attempting to identify a change in background pollutant concentrations that can be attributed to a single project, even one as large as the entire Friant Ranch Specific Plan,[5] is a theoretical exercise. The SJVAPCD brief noted that it "would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have" (SJVAPCD 2015). The situation is further complicated by the fact that background concentrations of regional pollutants are not uniform either temporally or geographically

5 The Friant Ranch Specific Plan proposed 2,683 single-family age-restricted units, 83 multifamily age-restricted units, 180 non-age-restricted multifamily units, and 250,000 square feet of commercial village within a Village Core that also provides for up to 50 residential units on approximately 942 acres (County of Fresno 2010).

throughout an air basin but are constantly fluctuating based upon meteorology and other environmental factors. SJVAPCD noted that the currently available modeling tools are equipped to model the impact of all emission sources in the San Joaquin Valley Air Basin on attainment (SJVAPCD 2015). The SJVAPCD brief then indicated that, "Running the photochemical grid model used for predicting O_3 attainment with the emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NO_x and VOC in the Valley) is not likely to yield valid information given the relative scale involved" (SJVAPCD 2015).

SCAQMD and SJVAPCD have indicated that it is not feasible to quantify project-level health impacts based on existing modeling (SCAQMD 2015; SJVAPCD 2015). Even if a metric could be calculated, it would not be reliable because the models are equipped to model the impact of all emission sources in an air basin on attainment and would likely not yield valid information or a measurable increase in O_3 concentrations sufficient to accurately quantify O_3-related health impacts for an individual project.

Nonetheless, following the Supreme Court's Friant Ranch decision, some environmental impact reports (EIRs) where estimated criteria air pollutant emissions exceeded applicable air district thresholds have included a quantitative analysis of potential project-generated health effects using a combination of a regional photochemical grid model[6] and the EPA Benefits Mapping and Analysis Program (BenMAP or BenMAP–Community Edition; EPA 2023).[7] The publicly available health impact assessments (HIAs) typically present results in terms of an increase in health effect incidences and/or the increase in background health effect incidences for various health outcomes resulting from the project's estimated increase in concentrations of O_3 and $PM_{2.5}$.[8] To date, the six publicly available HIAs reviewed herein have concluded that the evaluated project's health effects associated with the estimated project-generated increase in concentrations of O_3 and $PM_{2.5}$ represent a small increase in incidences and a very small percent of the number of background incidences, indicating that these health impacts are negligible and potentially within the models' margin of error. Additionally, while the results of the six available HIAs conclude that the project emissions do not result in a substantial increase in health effect incidences, the estimated emissions and assumed toxicity are also conservatively input into the HIA and thus overestimate health effect incidences, particularly for $PM_{2.5}$.

As explained in the SJVAPCD brief and noted previously, running the photochemical grid model used for predicting O_3 attainment with the emissions solely from an individual project like the Friant Ranch project or the project is not likely to yield valid information given the relative scale involved. The six examples

6 The first step in the publicly available HIAs includes running a regional photochemical grid model, such as the Community Multiscale Air Quality model or the Comprehensive Air Quality Model with extensions to estimate the increase in concentrations of O_3 and $PM_{2.5}$ as a result of project-generated emissions of criteria and precursor pollutants. Air districts, such as the SCAQMD, use photochemical air quality models for regional air quality planning. These photochemical models are large-scale air quality models that simulate the changes of pollutant concentrations in the atmosphere using a set of mathematical equations characterizing the chemical and physical processes in the atmosphere (EPA 2017).

7 After estimating the increase in concentrations of O_3 and $PM_{2.5}$, the second step in the six examples includes use of BenMAP or BenMAP–Community Edition to estimate the resulting associated health effects. BenMAP estimates the number of health effect incidences resulting from changes in air pollution concentrations (EPA 2023). The health impact function in BenMAP–Community Edition incorporates four key sources of data: (i) modeled or monitored air quality changes, (ii) population, (iii) baseline health effect incidence rates, and (iv) an effect estimate. All of the six example HIAs focused on O_3 and $PM_{2.5}$.

8 The following CEQA documents included a quantitative HIA to address Friant Ranch: (1) World Logistics Center Revised Final EIR (City of Moreno Valley 2019), (2) March Joint Powers Association K4 Warehouse and Cactus Channel Improvements EIR (March JPA 2019), (3) Mineta San Jose Airport Amendment to the Airport Master Plan EIR (City of San Jose 2020), (4) City of Inglewood Basketball and Entertainment Center Project EIR (City of Inglewood 2019), (5) San Diego State University Mission Valley Campus Master Plan EIR (SDSU 2019), and (6) California State University Dominguez Hills 2018 Campus Master Plan EIR (CSU Dominguez Hills 2019).

reviewed provide support to the SJVAPCD's brief's contention that consistent, reliable, and meaningful results may not be provided by methods applied at this time. Accordingly, additional work in the industry and, more importantly, air district participation, is needed to develop a more meaningful analysis to correlate project-level mass criteria air pollutant emissions and health effects for decision makers and the public. Furthermore, at the time of writing, no HIA has concluded that health effects estimated using the photochemical grid model and BenMAP approach are substantial, provided that the estimated project-generated incidences represent a very small percentage of the number of background incidences, potentially within the models' margin of error.

Construction of the project would result in emissions that would not exceed the SCAQMD thresholds for NO_x, after implementation of MM-AQ-1 through MM-AQ-4. Operation of the project, would result in exceedances of regional thresholds for emissions of VOCs, even after implementation of PDFs and MM- AQ-5 through MM-AQ-8. It should be noted that, as detailed in Table 4.3-15, overlapping emissions from the interim operational scenarios in 2029 and 2031 and construction of the project would exceed the recommended numerical thresholds of significance established by SCAQMD for emissions of VOCs and NO_x, even with the incorporation of all quantifiable mitigation measures.

As discussed in Section 4.3.1, Existing Conditions, health effects associated with O_3 include respiratory symptoms, worsening of lung disease leading to premature death, and damage to lung tissue. VOCs and NO_x are precursors to O_3, for which the SCAB is designated as nonattainment with respect to the NAAQS and CAAQS. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SCAB due to O_3 precursor emissions tend to be found downwind of the source location because of the time required for the photochemical reactions to occur. Further, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur, because exceedances of the O_3 NAAQS and CAAQS tend to occur between April and October when solar radiation is highest. As described above, due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of O_3 precursors is speculative. That being said, because the project would exceed the SCAQMD VOC and NO_x thresholds during project operations, the project could contribute to health effects associated with O_3.

Health effects associated with NO_x and NO_2 (which is a constituent of NO_x) include lung irritation and enhanced allergic responses (see Section 4.3.1). Although project-related NO_x emissions would exceed the SCAQMD operational mass daily thresholds, because the SCAB is a designated attainment area for NO_2 (and NO_2 is a constituent of NO_x) and the existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards,[9] it is not anticipated that the project would cause an exceedance of the NAAQS and CAAQS for NO_2 or result in potential health effects associated with NO_2 and NO_x. However, because the project would exceed the SCAQMD NO_x threshold during project operations, the project could contribute to health effects associated with NO_x and NO_2.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (see Section 4.3.2). CO tends to be a localized impact associated with congested intersections. The potential for CO hotspots is discussed in Section 4.3.5(3) and determined to be less than significant. Thus, the project's CO emissions would not contribute to significant health effects associated with CO.

9 See Table 4.3-3, which shows that ambient concentrations of NO_2 at the Anaheim–Vermont Street monitoring station did not exceed the NAAQS or CAAQS between 2021 and 2023.

Health effects associated with PM_{10} and $PM_{2.5}$ include premature death and hospitalization, primarily for worsening of respiratory disease (see Section 4.3.1). Operation of the project would not exceed the SCAQMD thresholds for PM_{10} and $PM_{2.5}$. As such, the project would not have the potential to contribute to exceedances of the NAAQS and CAAQS for PM and obstruct the SCAB from coming into attainment for these pollutants.

In summary, there are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days, and methods available to quantitatively evaluate health effects may not be appropriate to apply to emissions associated with the project, which cannot be estimated with a high level of accuracy.

Summary

Overall, for project-related construction the criteria air pollutant emissions would be below the SCAQMD construction thresholds after accounting for implementation of MM-AQ-1 through MM-AQ-4. Operation of the proposed project would exceed the criteria air pollutant operational thresholds established by the SCAQMD for emissions of VOCs even after the implementation of MM-AQ-1 through MM-AQ-8 and MM- GHG-1 (refer to Section 4.3.6 for text of air quality mitigation measures and Section 4.8.6 for GHG mitigation measures). Similarly, the overlapping construction and operation emissions during the interim operation phases would exceed the criteria air pollutant operational thresholds established by SCAQMD for emissions of VOC and NO_x, resulting in a significant and unavoidable impact even after the implementation of all feasible mitigation.

3. Would the project expose sensitive receptors to substantial pollutant concentrations?

Localized Significance Thresholds Analysis

Less-Than-Significant Impact. Construction activities associated with the project would result in temporary sources of on-site fugitive dust and construction equipment emissions. An LST analysis has been prepared to determine potential impacts to nearby sensitive receptors during construction of the project. As indicated in the discussion of the thresholds of significance, SCAQMD recommends the evaluation of localized NO_2, CO, PM_{10}, and $PM_{2.5}$ impacts due to construction activities because of sensitive receptors in the immediate vicinity of the project site. The impacts were analyzed using methods consistent with those in SCAQMD's Final Localized Significance Threshold Methodology (2008). According to the Final Localized Significance Threshold Methodology, "Off-site mobile emissions from the project should not be included in the emissions compared to the LSTs" (SCAQMD 2008). Trucks and worker trips associated with the project are not expected to cause substantial air quality impacts to sensitive receptors along off-site roadways since emissions would be relatively brief in nature and would cease once the vehicles pass through the main streets. Nonetheless, in an effort to conservatively capture potential vehicle activity within the project boundary (i.e., the fence line), a small portion (0.25 miles) of the off-site vehicle travel for worker vehicles, vendor trucks, and haul trucks were conservatively treated as on-site emissions for the LST analysis.

The estimated maximum daily unmitigated on-site construction emissions generated by the project are presented in Table 4.3-16 and compared to the applicable SCAQMD LSTs. See Appendix B-1 for supporting CalEEMod LST files.

Table 4.3-16. Localized Significance Thresholds Analysis for Project Construction – Unmitigated

Maximum On-Site Emissions	NO_2	CO	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Summer				
2026	57.89	64.29	5.70	2.61
2027	78.73	119.48	2.82	2.49
2028	156.81	227.62	9.11	5.20
2029	115.70	189.78	4.39	3.23
2030	87.45	147.12	4.20	2.23
2031	28.47	47.66	0.61	0.50
2032	18.66	31.63	0.37	0.30
Winter				
2026	44.77	56.30	3.59	1.78
2027	87.21	135.43	4.09	2.71
2028	135.77	217.85	7.24	3.98
2029	103.69	152.76	7.07	3.37
2030	78.32	131.97	4.09	2.14
2031	49.29	84.11	1.06	0.88
2032	18.68	31.89	0.37	0.30
Maximum Daily Emissions (Summer or Winter)	**156.81**	**227.62**	**9.11**	**5.20**
SCAQMD LST	*197*	*1,711*	*14*	*9*
LST Exceeded?	**No**	**No**	**No**	**No**

Source: SCAQMD 2009.
Notes: NO_2 = nitrogen dioxide; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District; LST = localized significance threshold.
LSTs are shown for a 5-acre project site corresponding to a distance to a sensitive receptor of 25 meters. The estimates reflect control of fugitive dust (watering two times daily) required by SCAQMD Rule 403.

As depicted in Table 4.3-16, the project would not result in emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ that would exceed the applicable SCAQMD LSTs without mitigation. As such, the project would result in less-than-significant impacts related to construction LSTs.

Health Effects of Carbon Monoxide (Potential for Carbon Monoxide Hotspots)

Less-Than-Significant Impact. Mobile source impacts occur on two scales. Regionally, project-related travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SCAB. Locally, traffic generated by the project would be added to the local roadway system near the project site. If such traffic occurs during periods of poor atmospheric ventilation, is composed of many vehicles cold-started and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SCAB is steadily decreasing.

At the time that the SCAQMD Handbook (1993) was published, the SCAB was designated nonattainment under the CAAQS and NAAQS for CO. In 2007, the SCAB was designated in attainment for CO under both the CAAQS and NAAQS as a result of the steady decline in CO concentrations in the SCAB due to turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities. SCAQMD conducted CO modeling for the 2003 AQMP (SCAQMD 2003b) for the four worst-case intersections in the SCAB[10]: (1) Wilshire Boulevard and Veteran Avenue, (2) Sunset Boulevard and Highland Avenue, (3) La Cienega Boulevard and Century Boulevard, and (4) Long Beach Boulevard and Imperial Highway. At the time the 2003 AQMP was prepared, the intersection of Wilshire Boulevard and Veteran Avenue was the most congested intersection in Los Angeles County, with an average daily traffic volume of about 100,000 vehicles per day. Using CO emission factors for 2002, the peak modeled CO 1-hour concentration was estimated to be 4.6 ppm at the intersection of Wilshire Boulevard and Veteran Avenue. When added to the maximum 1-hour CO concentration from 2021 through 2023 at the Mission Viejo Monitoring Station (see Table 4.3-3, Local Ambient Air Quality Data), which was 2.3 ppm in 2023, the 1-hour CO would be 6.9 ppm, while the CAAQS is 20 ppm.

The 2003 AQMP also projected 8-hour CO concentrations at these four intersections for 1997 and from 2002 through 2005. From years 2002 through 2005, the maximum 8-hour CO concentration was 3.8 ppm at the Sunset Boulevard and Highland Avenue intersection in 2002; the maximum 8-hour CO concentration was 3.4 ppm at the Wilshire Boulevard and Veteran Avenue in 2002. Adding the 3.8 ppm to the maximum 8-hour CO concentration from 2020 through 2022 at the Mission Viejo Monitoring Station (see Table 4.3-3), which was 1.9 ppm in 2023, the 8-hour CO would be 5.7 ppm, while the CAAQS is 9.0 ppm.

Accordingly, CO concentrations at congested intersections would not exceed the 1-hour or 8-hour CO CAAQS unless projected daily traffic would be over 100,000 vehicles per day based on the ambient CO concentration considered in the SCAQMD study. The traffic analysis prepared for the project evaluated average daily trips at nearby intersections to the project area. Under the worst-case scenario, which considers full project buildout in addition to the cumulative traffic of other future development projects pending City review, the maximum daily intersection volume was estimated to be 102,290 trips at the intersection of Bake Parkway and Marine Way. Based on SCAQMD's 2003 AQMP, peak CO concentrations in the SCAB were driven by meteorological and topographical conditions to a greater degree than by traffic congestion. Therefore, although the maximum daily volume at one intersection in the project area could exceed 100,000 vehicles per day under a worst-case scenario, the comparatively low ambient 1-hour and 8-hour CO concentrations observed in the project area (as discussed above) indicate that even the most congested intersection would require higher traffic volumes than 100,000 vehicles per day to approach levels of concern for generating a CO hotspot.

Furthermore, the Bay Area Air District includes in its 2022 CEQA Guidelines screening criteria for project-generation of local carbon monoxide levels (BAAQMD 2023). According to the Bay Area Air District, a project would result in a less-than-significant impact related to CO if project-generated traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. Based on the traffic study completed for the proposed project, the most congested intersection in the project vicinity, the intersection of Bake Parkway and Marine Way, would only result in 10,229 vehicles per hour during peak hours.

10 SCAQMD's CO hotspot modeling guidance has not changed since 2003.

Based on these considerations, the proposed project under the worst-case scenario would not result in a CO hotspot at any intersection in the project area. See Appendix B-3, Carbon Monoxide Hotspots Intersection Volume Calculations, for supporting intersection volume calculations.

Regarding potential CO hotspots during construction, the maximum daily trips during construction are estimated to be 922 daily trips (in 2029 during overlap of Phase 1, Phase 2, and Phase 3 construction), which would be substantially less than operational trip generation at project buildout (i.e., 10,825 net external trips per day). Thus, the maximum daily intersection volume with the addition of these vehicles on the roadway network during construction would be less than during operation. In addition, as identified in Table 4.3-16, the project would not result in on-site CO emissions that would exceed the SCAQMD LST.

Because the project would not contribute vehicles to any study intersection that would experience more than 100,000 vehicles per day during construction or operation and would not result in on-site CO emissions that would exceed the SCAQMD LST threshold during construction, a CO hotspot is not anticipated to occur, and associated impacts would be less than significant. As such, potential project-generated impacts associated with CO hotspots during construction and operation would be a less-than-significant impact.

Toxic Air Contaminants

Less-Than-Significant Impact with Mitigation Incorporated. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period would contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk assessment methodology (OEHHA 2015). In addition, some TACs have noncarcinogenic effects. TACs that would potentially be emitted during construction activities would be DPM emitted from heavy-duty construction equipment and heavy-duty trucks. Heavy-duty construction equipment and diesel trucks are subject to CARB's Airborne Toxic Control Measures to reduce DPM emissions. According to the Office of Environmental Health Hazard Assessment, HRAs should be based on a 30-year exposure duration based on typical residency period; however, such assessments should be limited to the period/duration of activities associated with a project (OEHHA 2015).

As discussed in Section 4.3.3, under the "Construction Health Risk Assessment" heading, a construction HRA was performed to estimate the Maximum Individual Cancer Risk and the Chronic Hazard Index from emissions generated by project construction for proximate residential receptors. Results of the construction HRA under unmitigated conditions are presented in Table 4.3-17.

Table 4.3-17. Construction Health Risk Assessment Results – Unmitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential Off Site	Per million	21.3	10	**Potentially significant**
Chronic Hazard Index – Residential Off Site	Index value	0.009	1.0	Less than significant
Maximum Individual Cancer Risk – Residential On Site	Per million	34.9	10	**Potentially significant**
Chronic Hazard Index – Residential On Site	Index value	0.02	1.0	Less than significant

Source: SCAQMD 2023a.

Notes: CEQA = California Environmental Quality Act; **bold text** indicates a potentially significant impact.
See Appendix B-2.

As shown in Table 4.3-17, project construction activities would result in a Residential Maximum Individual Cancer Risk of 21.3 in 1 million for off-site receptors and 34.9 in 1 million for on-site receptors, which exceeds the significance threshold of 10 in 1 million. Project construction would result in a Residential Chronic Hazard Index of 0.009 for off-site receptors and 0.02 for on-site receptors, both of which are below the 1.0 significance threshold. The project's construction TAC health risk impacts would be potentially significant, and mitigation would be required to reduce these impacts to less than significant.

Table 4.3-18 shows the project's construction health risk results with implementation of MM-AQ-1 (Construction Equipment Exhaust Minimization).

Table 4.3-18. Construction Health Risk Assessment Results – Mitigated

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Maximum Individual Cancer Risk – Residential Off Site	Per million	3.34	10	Less than significant
Chronic Hazard Index – Residential Off Site	Index value	0.001	1.0	Less than significant
Maximum Individual Cancer Risk – Residential On Site	Per million	6.64	10	Less than significant
Chronic Hazard Index – Residential On Site	Index value	0.003	1.0	Less than significant

Source: SCAQMD 2023a.
Notes: CEQA = California Environmental Quality Act.
See Appendix B-2.
Results include implementation of MM-AQ-1.

The HRA results after incorporation of MM-AQ-1 show that the Residential Maximum Individual Cancer Risk for off-site receptors, on-site receptors, and nonresidential receptors would be avoided as cancer risk would be reduced below the threshold of 10 in 1 million.

Operational Health Risks

As detailed by the SCAQMD, projects that typically result in low operational health risk impacts include residential uses (e.g., apartments, condos, mobile homes, single-family homes), commercial uses (e.g., offices, banks, government, pharmacies), recreational uses (e.g., parks, restaurants, golf courses, health clubs, hotels, theaters), educational uses (e.g., daycares, schools, colleges, libraries, churches), and retail uses (e.g., auto care, supermarkets, malls) (SCAQMD 2023b). The project is a primarily residential development that would include residential and park land uses, all of which were identified by SCAQMD as having low potential health risk impacts. Operation of the project would not result in any non-permitted direct emissions (e.g., those from a stationary source such as diesel generators)[11] or in a substantial increase in diesel vehicles (i.e., delivery trucks greater than 100 per day). Thus, the project would not result in a long-term (i.e., 9-year, 30-year, or 70-year) operational source of TAC emissions.

[11] Stationary sources result in on-site emissions and could generate TAC emissions; however, during the SCAQMD permitting process, an HRA would be performed and control measures would be implemented if required to reduce potential impacts to sensitive receptors.

Cumulative Health Risk

The SCAQMD does not have an established cumulative health risk approach but has initiated a public process (including four Working Group meetings as of January 2024) for the development of additional guidance for public agencies when they evaluate cumulative air quality impacts from increased concentrations of TACs for projects subject to the requirements of CEQA.

Notably, as part of this public process, SCAQMD has not included most construction activity in its cumulative health risk analysis recommendations, since construction is typically short-term. However, the draft applicability framework of the SCAQMD's cumulative health risk concept includes long-term construction, with transportation projects such as high-speed rail provided as the example. The draft applicability framework does not define what number of years equates to long-term construction. Because construction of the project is assumed to have a duration of 6 years, it may or may not qualify as a short-term project under the final SCAQMD guidance, if/once issued. Nonetheless, as described above, the project itself would result in health risk impacts from construction that would be less than significant with implementation of MM-AQ-1 (Construction Equipment Exhaust Minimization). Therefore, it is anticipated that the project would also not result in a cumulatively considerable health risk impact from construction.

In addition, SCAQMD has indicated that projects that consist of primarily residential development, such as the project, would also screen out of a cumulative health risk analysis for operations since they tend to have low potential cancer risk (SCAQMD 2023b).

Valley Fever

As discussed in Section 4.3.1, under header "Non-Criteria Air Pollutants," valley fever is not highly endemic to Orange County, with an incidence rate of 10.0 cases per 100,000 people in 2022 (CDPH 2023). The California counties considered highly endemic for valley fever include Kern (264.9 per 100,000), Kings (111.0 per 100,000), Tulare (65.7 per 100,000), San Luis Obispo (51.5 per 100,000), Fresno (44.3 per 100,000), Madera (32.4 per 100,000), and Ventura (28.3 per 100,000), which accounted for 50.5% of the reported cases in 2022 (CDPH 2023).

Even if present at the project site, construction activities may not result in increased incidence of valley fever. Propagation of valley fever is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. Valley fever spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing valley fever. Moreover, exposure to valley fever does not guarantee that an individual will become ill—approximately 60% of people exposed to the fungal spores are asymptomatic and show no signs of an infection (Saubolle et al. 2006).

In order to reduce fugitive dust from the project and minimize adverse air quality impacts, the project would employ dust control measures in accordance with SCAQMD Rules 401 and 403, which limit the amount of fugitive dust generated during construction. These requirements are consistent with California Department of Public Health recommendations for the implementation of dust control measures, including regular application of water during soil-disturbing activities, to reduce exposure to valley fever by minimizing the potential that the fungal spores become airborne (CDPH 2013). Further, regulations designed to minimize exposure to valley fever hazards are included in CCR Title 8 and would be complied with during the project's construction phase (California Department of Industrial Relations 2017).

In summary, the project would not result in a significant impact attributable to valley fever exposure based on its geographic location and compliance with applicable regulatory standards and dust control measures, which will serve to minimize the release of and exposure to fungal spores.

Summary

Overall, the project would result in emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ that would be lower than the applicable SCAQMD LSTs.

Moreover, because the project would not contribute vehicles to any study intersection that would experience more than 100,000 vehicles per day during construction or operation and would not result in on-site CO emissions that would exceed the SCAQMD LST threshold during construction, no CO hotspots are anticipated to occur.

Furthermore, the construction HRA results after incorporation of MM-AQ-1 (Construction Equipment Exhaust Minimization) show that the Residential Maximum Individual Cancer Risk for off-site receptors, on-site receptors, and nonresidential receptors would be avoided as cancer risk would be reduced below the threshold of 10 in 1 million. Regarding TAC during operation, because the project's type (community residential) is identified by the SCAQMD as one that would not result in a long-term (i.e., 9-year, 30-year, or 70-year) operational source of TAC emissions.

Lastly, the project's geographic location and compliance with applicable regulatory standards would limit the risk of exposure to valley fever.

Overall, the project's localized criteria air pollutant emissions, potential for CO hotspots, operational health risks from TACs, and valley fever exposure would be less than significant without mitigation. After the implementation of MM-AQ-1, the potential cancer health risk during construction would be less than significant with mitigation incorporated.

4. ***Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?***

Less-Than-Significant Impact. Construction and operation of the project would result in various emissions; however, criteria air pollutants, fugitive dust, and TACs are addressed in Sections 4.3.5(2) and 4.3.5(3). As such, this impact analysis is focused on the potential for an odor impact to occur. The occurrence and severity of potential odor impacts depend on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. In addition, project construction and operation would be required to comply with SCAQMD Rule 402, Nuisance, which prohibits the discharge of air pollutants from a facility that could cause injury, detriment, nuisance, or annoyance to the public or damage business or property. Therefore, impacts associated with odors during construction would be less than significant. No mitigation is required.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD 1993). The project would not include land uses that generate odors as discussed above during operation. The residences may emit odors outside during cooking or application of architectural coatings. These would be limited to the areas adjacent to the source and would not impact substantial numbers of people. These odors would also be short term in nature and would disperse rapidly. Any indoor odors would be limited to that building. Therefore, project operations would result in an odor impact that is less than significant. No mitigation is required.

Impact Summary

According to the City's tiered approach, the project would be inconsistent with the AQMP because it would require a general plan amendment, would be considered a regionally significant project by the SCAB, and would exceed the SCAQMD's mass daily criteria air pollutant significance thresholds. Therefore, the project would conflict with the applicable air quality plan, resulting in a significant and unavoidable impact.

After implementation of mitigation MM-AQ-1 through MM-AQ-8, the project would still exceed SCAQMD's mass daily criteria air pollutant thresholds during operation. Therefore, the project would 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; impacts would be significant and unavoidable.

The project's localized criteria air pollutant emissions, potential for CO hotspots, operational health risks from TACs, and valley fever exposure would be less than significant. After the implementation of MM-AQ-1, the potential cancer health risk during construction would be less than significant with mitigation incorporated.

Odors during construction would disperse rapidly from the project site and generally occur at magnitudes that would not affect substantial numbers of people. The project does not propose any land uses as a part of long-term operations that would generate odors or other emissions that would adversely affect a substantial number of people; therefore, impacts would be less than significant.

4.3.6 Mitigation Measures

MM-AQ-1 through MM-AQ-8 and MM-GHG-1 would address impacts relating to air quality that would be potentially significant, absent mitigation. Note the following regarding quantification of these mitigation measures:

- MM-AQ-1 is quantified in the construction analysis in the CalEEMod mitigation module, in which all off-road equipment with engines rated at 25 horsepower or greater was assumed to meet Tier 4 Final regulations.
- MM-AQ-2 is not quantified in the construction analysis because it is dependent on whether the equipment is commercially available; however, additional emission reductions are anticipated from implementation of MM-AQ-2.
- MM-AQ-3 is quantified in the construction analysis in the CalEEMod mitigation module, in which 10 grams/liter VOC was selected for residential interior, residential exterior, nonresidential interior, and nonresidential exterior.
- MM-AQ-4 is not quantified in the construction analysis.
- MM-AQ-5 through MM-AQ-8 are not quantified in the operational analysis.

The air quality mitigation measures are presented in full as follows:

MM-AQ-1 Construction Equipment Exhaust Minimization. Prior to the commencement of any construction activities, the applicant or its designee shall provide evidence to the City of Irvine (City) of the following: For off-road equipment with engines rated at 25 horsepower or greater, no construction equipment shall be used that is less than Tier 4 Final.

An exemption from the above requirement may be granted if the applicant documents that equipment with Tier 4 Final engines is not reasonably available, and the required corresponding reductions in criteria air pollutant emissions can be achieved for the project through other combinations of construction equipment. Before an exemption may be granted by the City's Community Development Director, the applicant's construction contractor shall demonstrate (1) that at least 3 construction fleet owners/operators in Orange County were contacted and that those owners/operators confirmed Tier 4 Final equipment could not be located within Orange County during the desired construction schedule and (2) that the proposed replacement equipment has been evaluated using California Emissions Estimator Model (CalEEMod) or other industry standard emission estimation method and documentation provided to the City to confirm that project-generated emissions will not exceed the estimated maximum daily construction criteria air pollutant emissions (with mitigation) set forth in Table 4.3-12 of the Draft EIR.

MM-AQ-2 Additional Construction Equipment Emission Reductions. Prior to the issuance of grading permits, the project applicant or its designee shall provide evidence to the City of Irvine (City) that the following strategies shall be implemented during the project's construction phase:

A. Use electric or hybrid powered equipment for small pieces of equipment under 25 horsepower (e.g., forklifts), as commercially available.
B. Use cleaner-fuel equipment, such as replacing diesel fuel with compressed natural gas or renewable diesel, as commercially available.

Commercially available equipment is herein defined as equipment sourced within 50 vehicle miles of the project site and within 10% of the cost of the diesel-fueled equivalent equipment. The project applicant must contact at least three contractors or vendors within Orange County and submit justification to the City if the specified equipment is not commercially available.

MM-AQ-3 Use of Super-Compliant Low-VOC Paint During Construction. During construction, the project shall use super-compliant low–volatile organic compound (VOC) paint (less than 10 grams per liter VOC) for all interior and exterior paint applications for residential and nonresidential land uses.

MM-AQ-4 Limit Truck and Equipment Idling During Construction. The project applicant shall reduce idling time of heavy-duty trucks either by requiring them to be shut off when not in use or limiting the time of idling to no more than 3 minutes (thereby improving upon the 5-minute idling limit required by the state Airborne Toxics Control Measure, 13 CCR 2485). The project applicant shall post clear signage reminding construction workers to limit idling of construction equipment.

MM-AQ-5 Low-VOC Cleaning Supplies and Paint Educational Program. Prior to the occupancy of any on-site development, the applicant or its designee shall provide evidence to the City of Irvine that the applicant/phase developer has developed a Green Cleaning Product and Paint education program to be made available at rental and purchasing offices and/or on websites. The educational program shall include a flyer (hardcopy and/or digital) that includes, at a minimum, an explanation of what volatile organic compounds (VOCs) are, how VOCs affect us, and where to find low-VOC alternatives for cleaning supplies and paint, as well as including additional resources for learning more.

MM-AQ-6 Use of Low-VOC Cleaning Supplies and Paint for Spaces Operated by Homeowner's Association. Prior to the issuance of building permits, the applicant or its designee shall provide evidence to the City of Irvine that for applicant (or its designee) and homeowner's association–operated spaces that provisions are in place to ensure that only zero– or low–volatile organic compound (VOC) cleaning supplies and super-compliant VOC paints (less than 10 grams per liter VOC) are used during project operation.

MM-AQ-7 Use of Zero-Emission Landscape Equipment for Homeowner's Association Land. Only zero-emissions landscaping equipment shall be used during project operation on homeowner's association land. Gasoline-fueled landscaping equipment shall be prohibited consistent with the City's Ordinance No. 23-25.

MM-AQ-8 Landscape Maintenance Equipment Emission Reduction. The project applicant shall implement the following landscape maintenance equipment emission reduction measures:

- **Include Outdoor Electrical Outlets.** Prior to the issuance of building permits, the project applicant or its designee shall provide evidence to the City of Irvine that the design plans include electrical outlets on the exterior of the structure to facilitate use of electrical lawn and garden equipment.
- **Encourage Use of Existing Yard Equipment Exchange and Rebate Programs.** The project's future homeowner's association shall educate future residents about the South Coast Air Quality Management District Electric Lawn Mower Rebate Program and the Commercial Electric Lawn and Garden Equipment Exchange Program. When conventional gasoline-powered yard equipment (e.g., lawn mowers, leaf blowers and vacuums, shredders, trimmers, and chainsaws) are exchanged for electric and rechargeable-battery-powered yard equipment, direct greenhouse gas (GHG) emissions from fossil-fuel combustion are displaced by indirect GHG emissions associated with the generation of electricity used to power the equipment.

The following mitigation measure from Section 4.8, Greenhouse Gas Emissions, of the Draft EIR would also reduce air quality impacts (refer to Section 4.8.6 for text of MM-GHG-1):

- MM-GHG-1 (Installation of Additional Electric Vehicle Chargers Beyond Title 24 Compliance)

4.3.7 Level of Significance After Mitigation

Impacts relating to a potential conflict with the SCAQMD 2022 AQMP would be significant and unavoidable, even after implementation of all feasible mitigation measures.

Regarding cumulatively considerable increases of criteria air pollutants, implementation of MM-AQ-1 would reduce potential construction emissions from the project to below the SCAQMD significance threshold for NO_x. Because emissions from project operations would cause an exceedance of the SCAQMD significance threshold for VOC, and VOC and NO_x emissions in the interim operation that would overlap with construction project operations would result in a potentially significant impact prior to mitigation. The implementation of MM-AQ-5 through MM-AQ-8 and MM-GHG-1 would reduce operational criteria air pollutant emissions; however, these are not readily quantified in the operational analysis. Operational emissions would continue to exceed the SCAQMD significance threshold for VOCs in the long term and NO_x emissions temporarily during interim operation. Accordingly, the potential of the project to violate any air quality standard or contribute substantially to an existing or projected air quality violation with mitigation would be significant and unavoidable.

Exposure of sensitive receptors to substantial pollutant concentrations would be less than significant without mitigation related to CO hotspots, localized emissions during construction, health risk from long-term TAC exposure, cumulative health risk, and valley fever exposure. For construction health effects from TACs, the project would result in a potentially significant impact to cancer risk prior to mitigation. Implementation of MM-AQ-1 would reduce DPM emissions associated with construction of the project, and the associated cancer risk would be below levels of significance.

The project would result in a less-than-significant impact regarding other emissions, including those leading to odors, during construction and operation.

4.3.8 Cumulative Impacts

This section provides an analysis of cumulative impacts from construction and operation of the project and other past, present, and reasonably foreseeable future projects, as required by Section 15130 of the CEQA Guidelines. The past, present, and reasonably foreseeable future projects (i.e., cumulative projects) used for this analysis are presented in Table 3-1, Cumulative Projects, of Chapter 3, Project Description, of this Draft EIR. For the purposes of air quality emissions, this cumulative analysis considers emissions within the air basin (i.e., SCAB).

As discussed in Section 4.3.5, Impacts Analysis, the City has adopted a tiered approach to addressing the project's potential to conflict with or obstruct implementation of the 2022 AQMP (City of Irvine 2020). As detailed in the project-specific analysis, the project would exceed the SCAQMD regional thresholds, even with implementation of mitigation measures, and as such, the project would be inconsistent with the AQMP according to the City's CEQA Manual guidance and would result in a significant and unavoidable project-specific impact. As the project would result in a significant and unavoidable impact at a project level, the project would also result in a significant and unavoidable cumulative impact regarding the potential to conflict with or obstruct implementation of the 2022 AQMP.

As discussed previously, air pollution by nature is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SCAQMD develops and implements plans for future attainment of ambient air quality standards. The potential for the project to result in a cumulatively considerable impact, specifically, a cumulatively considerable new increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS and/or CAAQS, is addressed in Section 4.3.5. Consistent with the finding for the project, the cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment would be less than significant during construction but significant for operation. Therefore, the project would result in a cumulatively significant impact regarding the potential to result in a cumulatively considerable net increase of any nonattainment criteria pollutant.

As discussed in Section 4.3.5, regarding sensitive receptors, the project would result in a less-than-significant impact for construction and operational impacts after mitigation. Emissions of TACs during construction and operation would not exceed applicable thresholds for off-site or on-site receptors. The project would also not cause or create a CO hotspot. The impact of the project, in addition to growth, including other cumulative projects, could further increase the exposure of air quality pollutants to sensitive receptors. However, cumulative projects as listed in Table 3-1 (see Chapter 3 of this EIR) would not result in substantial concentrations of TAC emissions during operation because they are predominantly residential and commercial projects with the majority of their emissions (mobile sources) occurring off site. Emissions during construction would disperse rapidly from the project sites and would generally occur at magnitudes that would not affect substantial numbers of people. Consistent with the significance finding for the project, during construction there would be a less-than-significant cumulative impact related to exposure of sensitive receptors to substantial pollutant concentrations from TACs after implementation of MM-AQ-1. Consistent with the significance finding for the project, during operation there would be a less-than-significant cumulative impact with mitigation incorporated related to exposure of sensitive receptors to substantial pollutant concentrations from TACs.

As discussed in Section 4.3.5, regarding odors or other emissions, the project would result in a less-than-significant impact during construction and operation. Odor impacts are generally limited to the immediate area surrounding the source. Potential odors from the project site would be temporary and limited (due to the type of land uses—recreational and residential are not typically substantial odor-producing land uses) and cumulative projects listed in Table 3-1 of this Draft EIR, among other developments in the SCAB, would be subject to SCAQMD Rule 402. Therefore, the project would not contribute to a cumulatively considerable impact regarding other emissions, such as those leading to odors, which would adversely affect a substantial number of people. The cumulative impact would be less than significant.

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