5.11 AIR RESOURCES

5.11.1 INTRODUCTION

The County of Los Angeles Department of Regional Planning Environmental Checklist Form, which has been prepared pursuant to the California Environmental Quality Act (CEQA), requires that air quality issues be evaluated as part of the environmental documentation process. The Project's air quality impacts are analyzed at a project-level of detail; direct and indirect impacts are addressed for each threshold criterion for both the on-site and off-site Project features. Growth-inducing impacts and cumulative impacts are described in Sections 6.0 and 7.0 of this EIR, respectively.

Summary

This section analyzes the temporary/construction-related and long-term/operational-related regional air quality emissions, local pollutant concentrations, and exposure of sensitive receptors to pollutants resulting from implementation of the Project. Analyses of health risks to sensitive receptors from toxic air contaminant emissions generated by stationary sources, minor sources, and by vehicles on State Route (SR) 138 are provided. Odor impacts and consistency with air quality management plans are also analyzed.

The northern 91 percent of the Project site lies within the boundaries of the Antelope Valley Air Quality Management District (AVAQMD), while the remaining 9 percent lies within the South Coast Air Quality Management District (SCAQMD).

The Project's construction emissions would exceed AVAQMD annual mass emissions thresholds for nitrogen oxides (NOx) and SCAQMD daily mass emissions thresholds for volatile organic compounds (VOC) and NOx.

Implementation of mitigation measures (MMs) 11-2 and 11-3 would substantially reduce construction-related NOx and would also reduce VOC emissions, but the impact would remain significant and unavoidable after mitigation. Construction mass emissions of inhalable particulate matter with a diameter of 10 microns or less (PM10), fine particulate matter with a diameter of 2.5 microns or less (PM2.5), carbon monoxide (CO), and sulfur oxides (SOx) would be less than significant. During later phases of construction, concentrations of PM10 and PM2.5 from construction activities could exceed ambient air quality standards and potentially expose sensitive receptors in the completed area of the development to substantial pollutant concentrations. This impact would be significant and unavoidable.

At buildout of the Project, in 2035, long-term operational emissions of VOC, NOx, CO, PM10, and PM2.5 would exceed AVAQMD and SCAQMD CEQA significance thresholds. The primary source of long-term emissions would be from vehicle operations. MM 11-4, MM 11-5, and MM 11-6 would be implemented to reduce operational emissions; however, the impact would remain significant and unavoidable. It should be noted that the Project's proposed residential and non-residential uses have been planned for a balance between the number of jobs available and the number of on-site housing units in an effort to encourage local trip

making. The Centennial Traffic Study located in Appendix 5.10-A of this EIR forecasts that around 48 percent of the daily trip generation will be internal to the Project site, while 52 percent will be external trips. The Project would require the establishment of a Transportation Management Association (TMA) that develops strategic linkages with other Antelope Valley/Santa Clarita Valley TMAs or like organizations in order to maximize transit efficiencies and services. The TMA would reduce dependence on the automobile and provide for a more efficient use of transportation resources among Project occupants, thereby reducing pollutant emissions.

The Project's stationary sources (natural gas-fired boilers, emergency generators, broilers, and small source particulate matter generators) would be limited in size and number by MM 11-1, which requires implementation of PDF 11-1. With these limits, stationary source emissions would not exceed ambient air quality standards or health risk (cancer and non-carcinogenic) standards, and the impacts would be less than significant.

The Project would not contribute to off-site traffic conditions that would violate ambient CO standards; therefore, this impact would be less than significant.

MM 11-10 requires the implementation of PDF 11-6, which specifies that residences or other sensitive land uses shall not be built within 150 feet of SR-138. The analysis demonstrates that the incremental cancer risk and chronic non-cancer health risk to sensitive receptors beyond the 150-foot buffer would be less than significant. The analysis also indicates that health risks to existing residents adjacent to SR-138 in the Project vicinity would be less than significant with incorporation of MM 11-10.

There would be less than significant impacts related to potential offensive odors generated by the wastewater reclamation facilities (WRFs) or the Materials Recovery Facility/Transfer Station (MRF/TS), which would allow for mulching/composting operations.

The Project would not conflict with AVAQMD and SCAQMD air quality management plans (AQMP) because the land uses, population, and vehicle travel elements of the Project are anticipated in the Southern California Association of Governments (SCAG) *2012–2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) and the SCAG 2016–2040 RTP/SCS, which is the basis for AQMP development. The impact would be less than significant.

Section Format

As described in Section 5.0, Environmental Setting, Impacts, and Mitigation, and in accordance with State CEQA Guidelines Article 9 (Contents of Environmental Impact Reports), each topical environmental analysis includes a description of the existing setting; identification of thresholds of significance; analysis of potential Project effects and identification of significant impacts; identification of mitigation measures, if required, to reduce the impacts; and level of significance after mitigation. This information is presented

in the following format (please refer to Section 2.0, Introduction, and Section 5.0, Environmental Setting, Impacts, and Mitigation, for descriptions of each of these topics):

- Introduction
  - Purpose
  - Summary
  - Section Format
  - Air Pollutants
  - References
- Relevant Plans, Policies, and Regulations
- Environmental Setting
- Project Design Features
- Threshold Criteria
- Environmental Impacts—A separate analysis is provided for each of the following categories of potential impacts:
  - On-Site Impacts
  - Off-Site Impacts
- Mitigation Measures
- Level of Significance After Mitigation
- References

Air Pollutants

Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS) for seven major pollutants (ozone [O_3], PM10, PM2.5, CO, nitrogen dioxide [NO_2], sulfur dioxide [SO_2], and lead), often referred to as criteria pollutants. CARB has also developed CAAQS for four additional pollutants: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Table 5.11-1, California and National Ambient Air Quality Standards, presents the State and national ambient air quality standards. A brief explanation of each criteria pollutant and their health effects is presented below.

Emissions are discussed in terms of mobile, area, energy, and stationary sources. Mobile sources refer to motor vehicles, engines, and equipment that moves or can be moved from place to place, and include vehicles that operate on roads and highways ("on-road" or "highway" vehicles), as well as off-road vehicles, engines, and equipment. Off-road vehicles include construction equipment. Area sources refer to dispersed sources of pollution that emit pollutants from a specified area; these include consumer products, fireplaces, landscaping maintenance equipment, and other sources associated with a particular land use. Energy sources are natural gas uses, typically for building heat and hot water. Stationary sources refer to any fixed emitter of air pollutants, such as fossil fuel-burning power plants, petroleum refineries, petrochemical plants, food processing plants, gas stations, emergency

generators, central boilers, and other industrial and commercial sources. Stationary sources are typically required to obtain permits to operate from air pollution agencies.

TABLE 5.11-1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[a]	Secondary[b]
O_3[c]	1 Hour	0.09 ppm (180 µg/m³)	–	–
	8 Hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	Same as Primary
PM10	24 Hour	50 µg/m³	150 µg/m³	Same as Primary
	AAM	20 µg/m³	–	Same as Primary
PM2.5	24 Hour	–	35 µg/m³	Same as Primary
	AAM	12 µg/m³	12.0 µg/m³	15.0 µg/m³
CO	1 Hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	–
	8 Hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)	–	–
NO_2	AAM	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
	1 Hour	0.18 ppm (339 µg/m³)	0.100 ppm (188 µg/m³)	–
SO_2	24 Hour	0.04 ppm (105 µg/m³)	–	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m³)
	1 Hour	0.25 ppm (655 µg/m³)	0.075 ppm (196 µg/m³)	–
Lead	30-day Avg.	1.5 µg/m³	–	–
	Calendar Quarter	–	1.5 µg/m³	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m³	
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m³		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m³)		

O_3: ozone, ppm: parts per million, µg/m³: micrograms per cubic meter, –: No Standard; PM10: respirable particulate matter with a diameter of 10 microns or less, AAM: Annual Arithmetic Mean, PM2.5: fine particulate matter with a diameter of 2.5 microns or less, CO: carbon monoxide, mg/m³: milligrams per cubic meter, NO_2: nitrogen dioxide, SO_2: sulfur dioxide, km: kilometer.

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

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

Note: More detailed information in the data presented in this table can be found at the CARB website (www.arb.ca.gov).

Source: CARB 2016a.

Ozone (O_3)

O_3 is a secondary pollutant; it is not directly emitted. O_3 is formed by chemical reactions between VOCs (also referred to as reactive organic gasses [ROGs]) and NOx, which occur only in the presence of bright sunlight. VOC/ROG emissions are generally unburned hydrocarbons that are a result of motor vehicle travel and other combustion sources. Nitrogen oxides are also a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level $O_3$to form. (Not to be confused with the "ozone layer" which occurs very high in the atmosphere and shields the planet from some ultraviolet [UV] rays.) As a result, O_3 is known as a summertime air pollutant. Ground-level ozone is the primary constituent of smog. Because ground-level ozone is formed in the atmosphere, high concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active are the most sensitive when O_3 levels are unhealthy. Numerous scientific studies have linked ground-level O_3 exposure to a variety of health problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to O_3pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ground-level O_3 can also have detrimental effects on plants and ecosystems. These effects include:

- interfering with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition, and harsh weather;
- damaging the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, national parks, and recreation areas; and
- reducing crop yields and forest growth, potentially impacting species diversity in ecosystems.

Currently, the South Coast Air Basin (SoCAB) and Mojave Desert Air Basin (MDAB) are designated as "Nonattainment Areas" for the State and federal O_3 standards.

Particulate Matter (PM10, PM2.5, and UFP)

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are inhalable particulate matter, which are those particles equal to or smaller than 10 microns in size (PM10); fine particulate matter, which are particles smaller than or equal to 2.5 microns (PM2.5); and ultrafine particulate matter (UFP), which are particles less than 0.1 micron. The size of the particulate matter refers to

the aerodynamic diameter of the particulate. Smaller particulates are of greater concern because they can penetrate deeper into the lungs than large particles. PM2.5 is directly emitted in combustion exhaust and fugitive dust and is formed from atmospheric reactions between various gaseous pollutants, including NOx, SOx, and VOCs. PM10 is directly emitted as a result of mechanical processes that crush or grind larger particles or from the re-suspension of dusts most typically through construction activities and vehicular travels. PM2.5 and PM10 can remain suspended in the atmosphere for days and/or weeks and can be transported long distances. Ultrafine particles are the smallest particles and are good indicators of any kind of fuel burning, from diesel engines to refinery operations.

The principal health effects of airborne particulate matter are on the respiratory and cardiac systems. According to the USEPA, some people are more sensitive than others to breathing fine particles (USEPA 2017). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths. However, all people exposed to elevated levels of particulate matter may experience temporary health effects (USEPA 2016a).

Short-term exposure to high PM2.5 levels is associated with premature mortality and increased hospital admissions and emergency room visits. Long-term exposure to high PM2.5 levels is associated with premature mortality and development of chronic respiratory disease. Short-term exposure to high PM10 levels is associated with hospital admissions for cardiopulmonary diseases, increased respiratory symptoms, and possible premature mortality. There are national and State24-hour PM10 standards, but there is no annual long-term standard. With respect to long-term PM10 health effects, the USEPA concluded in a 2006 standards review that analysis of air quality data showed that the 24-hour PM10 standard generally resulted in annual average PM10 levels at or below the annual standard of 50 $\mu g/m^3$ and that available evidence did not suggest an association between long-term exposure to PM10 at 2006 ambient levels and health problems. Based on this conclusion, the national PM10 annual standard was revoked (USEPA 2006). However, California maintains an annual PM10 standard.

Particulate matter in the AVAQMD tends to be primarily fugitive dust. This dust appears to be generated by both local sources and by region-wide dust during moderate to high wind episodes. These regional episodes tend to be multi-district and sometimes interstate in scope. The AVAQMD has identified the local sources of fugitive dust to be primarily unpaved road travel; construction and local disturbed areas of soil concentrated in the urban populated areas in the district; and seasonal agricultural operations (AVAQMD 2005).

No federal or State standards have been established for UFP. Currently, PM10 levels in the SoCAB and MDAB are designated as "Nonattainment areas" for State standards and "Attainment/Maintenance areas" for federal standards. PM2.5 levels in the SoCAB are designated as "Nonattainment areas" for State and federal standards; the MDAB is

designated as Unclassified/attainment for the PM2.5 federal standard and Unclassified for the PM2.5 State standard.

Carbon Monoxide (CO)

CO is a colorless and odorless gas which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections; along heavily used roadways carrying slow moving traffic; and at or near ground level. Even under the most severe meteorological and traffic conditions, high CO concentrations are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways. Overall, CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Currently, CO levels in the SoCAB and MDAB are in attainment for State and federal one-hour and eight-hour standards.

Nitrogen Dioxide (NO_2)

Nitrogen gas, normally relatively inert (unreactive), comprises about 80 percent of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen to form several different gaseous compounds collectively called nitrogen oxides (NOx). NO is converted to NO_2, a red-brown pungent gas, in the atmosphere. Motor vehicle emissions are the main source of NOx in urban areas.

NO_2 is toxic to various animals and to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane, and skin. In animals, long-term exposure to NOx increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2 can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

NOx is primarily a combination of NO and NO_2. While the NAAQS and CAAQS only address NO_2, the total group of nitrogen oxides is of concern. NO and NO_2 are both precursors in the formation of O_3 and PM2.5. Because of this and the fact that NO emissions largely convert to NO_2, NOx emissions are typically examined when assessing potential air quality impacts. Currently, NO_2 levels in the SoCAB and MDAB are in attainment for State and federal standards.

Sulfur Dioxide (SO_2)

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

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

Lead

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming (or hematopoietic), the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles and the decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (e.g., lead smelters, battery manufacturers, and battery recyclers) and are not undertaken for transportation, residential, or commercial development projects. Both the SoCAB and MDAB are in attainment for the State lead standard. The Los Angeles County portion of the SoCAB is classified nonattainment for the federal lead standard.

Visibility Reducing Particles

Visibility reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consist of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt. The State standard is intended to limit the frequency and severity of visibility impairment due to regional haze. Both the SoCAB and the MDAB are "unclassified" for this pollutant. There are no federal standards for visibility reducing particulates.

Sulfates (SO_4)

Sulfates (SO_4) are the fully oxidized ionic form of sulfur. SO_4occurs in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to SO_4 takes place comparatively rapidly and completely in California urban areas due to regional meteorological features.

The CARB's SO_4 standard is designed to prevent aggravation of respiratory symptoms. Effects of SO_4 exposure at levels above the standard include a decrease in respiratory function; aggravation of asthmatic symptoms; and an increased risk of cardiopulmonary disease. SO_4 is particularly effective in degrading visibility and, due to fact that it is usually acidic, can harm ecosystems and damage materials and property. Both the SoCAB and MDAB are in attainment for the State SO_4 standard.

Hydrogen Sulfide (H_2S)

H_2S is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. It can also be present in sewer gas and some natural gas, and it can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the standard will result in exposure to a very disagreeable odor. In 1984, a CARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance (CARB 2009). Both the SoCAB and the MDAB are "unclassified" for this pollutant.

Vinyl Chloride (Chloroethene)

Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans. Vinyl chloride is not routinely measured in the SoCAB or MDAB. California has a vinyl chloride standard, but there is no corresponding federal standard.

Toxic Air Contaminants

In addition to criteria air pollutants, toxic air contaminants (TACs) emitted from mobile and stationary sources must be taken into consideration for projects proposing new sources of TAC emissions. TACs are those pollutants that are known or suspected to cause cancer or other serious health effects (e.g., reproductive effects or birth defects) or adverse environmental effects.

Installation and operation of stationary equipment that emit TACs generally require permits from the applicable air district, and a Health Risk Assessment (an HRA) of TAC emissions may be a requirement under the permitting process. Land uses that would result in a long-term increase in mobile TAC emissions (e.g., distribution centers with diesel emissions from delivery trucks) also may require the preparation of an HRA. The HRA evaluates the risks posed to sensitive receptors (e.g., residents, schools, hospitals, and parks) in the vicinity of proposed TAC source(s) and must not exceed significance thresholds. Significance thresholds have been established in terms of cancer risk and hazard index.

Carcinogenic risks (i.e., cancer risks) are estimated as the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a probability (e.g., 10 in 1 million). Hazard indices (HIs) express the potential for chemicals to result in non-cancer health impacts, and non-carcinogenic chemicals should not be present at levels expected to cause adverse health effects (i.e., HI greater than one). HIs are expressed using decimal notation (e.g., 0.001). If there is a reference exposure level of greater than 1, then impacts would be considered potentially significant. The National Contingency Plan (NCP, in accordance with *Code of Federal Regulations* [CFR], Title 40, Part 300) is commonly cited as the basis for target risk and hazard levels. According to the NCP, lifetime incremental cancer risks posed by a site should not exceed the range of between 1 in 1 million and 100 in 1 million. Pursuant to SCAQMD Rule 1401(d)(1) and AVAQMD Rule 1401(E)(3)(e), the risks associated with potential exposure to emissions from a source equipped with the best available control technology for toxics (T-BACT) and from all emissions sources included in a "project" are acceptable if the incremental cancer risk is less than ten in one million, and is less than one in one million for sources not equipped with T-BACT. A brief explanation of diesel particulate matter and its potential health effects is presented below. Additional TACs are discussed in Appendix 5.11-D.

Diesel Particulate Matter

Diesel particulate matter (diesel PM) is part of a complex mixture that makes up diesel exhaust emitted from a broad range of diesel engines, including on-road diesel engines of trucks, buses, and cars and the off-road road diesel engines that include locomotives, marine vessels, and heavy-duty equipment. Diesel exhaust is composed of gas and particles. The gas phase is composed of many urban hazardous air pollutants, such as acetaldehyde, benzene, and formaldehyde. The particle phase includes categories of fine and ultra-fine particles that, when inhaled, can cause immunological effects including lung inflammation and cellular changes in the lung. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings. In 1998, the California Office of Environmental Health Hazards (OEHHA) listed diesel PM as a TAC based on its potential to cause cancer and other adverse health effects. Under California regulatory guidelines, diesel exhaust, as a mixture, is identified as a known carcinogen. .

References

All references cited for preparation of this analysis are listed in Section 5.11.10. The primary technical references for this section are listed below.

1. California Emissions Estimator Model for the Centennial Project (Appendix 5.11-A)
2. ENVIRON International Corporation. 2009a (September). *Air Quality Analysis for Stationary Sources Allowed by the Centennial Specific Plan.* San Francisco and Emeryville, CA: Environ (Appendix 5.11-B).
3. ENVIRON International Corporation. 2009b (June). *Centennial Supplemental Air Quality Analysis*. Emeryville, CA: ENVIRON (Appendix 5.11-C).
4. South Coast Air Quality Management District Rule 403 Tables 1 and 2. (Appendix 5.11-D)

5.11.2 RELEVANT PLANS, POLICIES, AND REGULATIONS

Federal

U.S. Environmental Protection Agency

The USEPA's air quality mandates are drawn primarily from the Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990. The USEPA is responsible for setting and enforcing the NAAQS for criteria pollutants, which are discussed above in Section 5.11.1, Introduction and shown in Table 5.11-1, California and National Ambient Air Quality Standards. Regional air quality is defined by whether the area has attained or not attained State and federal standards, as determined by monitoring. As part of its enforcement responsibilities, the USEPA requires each State with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain and maintain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution by using a combination of performance standards and market-based programs within the SIP-identified timeframe.

State

California Clean Air Act (CCAA)

The California Clean Air Act of 1988 provides the basis for air quality planning and regulation independent of federal regulations. A major element of the Act is the requirement that local air districts in violation of the CAAQS must prepare attainment plans that identify air quality problems, causes, trends and actions to be taken to attain and maintain California's air quality standards by the earliest practicable date (CARB 2016b).

California Air Resources Board (CARB)

CARB, a part of the California Environmental Protection Agency (CalEPA), is responsible for coordinating and administering both the federal and State air pollution control programs in

California. In this capacity, CARB conducts research; sets the California Ambient Air Quality Standards (CAAQS), as shown in Table 5.11-1; compiles emission inventories; develops suggested control measures; oversees local programs; and prepares the SIP. For regions that do not attain the CAAQS, CARB requires the air districts to prepare plans for attaining the standards. These plans are then integrated into the State SIP. CARB establishes emissions standards for (1) motor vehicles sold in California; (2) consumer products (e.g., hair spray, aerosol paints, barbecue lighter fluid); and (3) various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

The California Code of Regulations (CCR, specifically, Title 13, Section 2485) places restrictions on vehicular idling. It requires that on or after February 1, 2005, any person that owns, operates, or causes to operate any diesel-fueled commercial motor vehicle with gross vehicular weight ratings of greater than 10,000 pounds must prohibit vehicle idling for more than five consecutive minutes at any location. Additionally, diesel-fueled internal combustion engine auxiliary power systems (APS) must be prohibited from operating for greater than 5 minutes at any location when within 100 feet of any property zoned for individual or multi-family housing units, schools, hotels, motels, hospitals, senior care facilities or child care facilities.

Title 24 Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings (24 CCR 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The current applicable standards are the 2013 Standards, effective July 1, 2014. The 2016 Code was published on July 1, 2016, and will go into effect on January 1, 2017 (CBSC 2016). The 2016 code is estimated to be at least 28 percent more efficient for than the 2013 Code for residential buildings and 5 percent more efficient for nonresidential buildings (CEC 2015a, 2015b). The requirements of the energy efficiency standards result in the reduction of natural gas and electricity consumption. Since natural gas use produces criteria pollutant emissions, a reduction in natural gas consumption results in a related reduction in air quality emissions.[1] Additional discussion of the Title 24 energy efficiency standards is included in Section 5.21, Greenhouse Gas Emissions.

Title 24 Green Building Standards

The 2013 California Green Building Standards Code (24 CCR 11), also known as the CALGreen code, contains mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools and hospitals) throughout California (CBSC 2016). The 2016 CALGreen Code was effective January 1, 2017 (CBSC 2016b). The development of the CALGreen Code is intended to (1) cause a reduction in greenhouse gas (GHG) emissions from buildings; (2) promote environmentally responsible, cost effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce

1 Because electricity is not generated on site, the emissions associated with electricity generation are not included in the emissions calculations.

construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

The CALGreen Code contains requirements for construction site selection, storm water control during construction, construction waste reduction, indoor water use reduction, material selection, natural resource conservation, site irrigation conservation, and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, such as heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

The CALGreen Code provides mandatory requirements for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others.

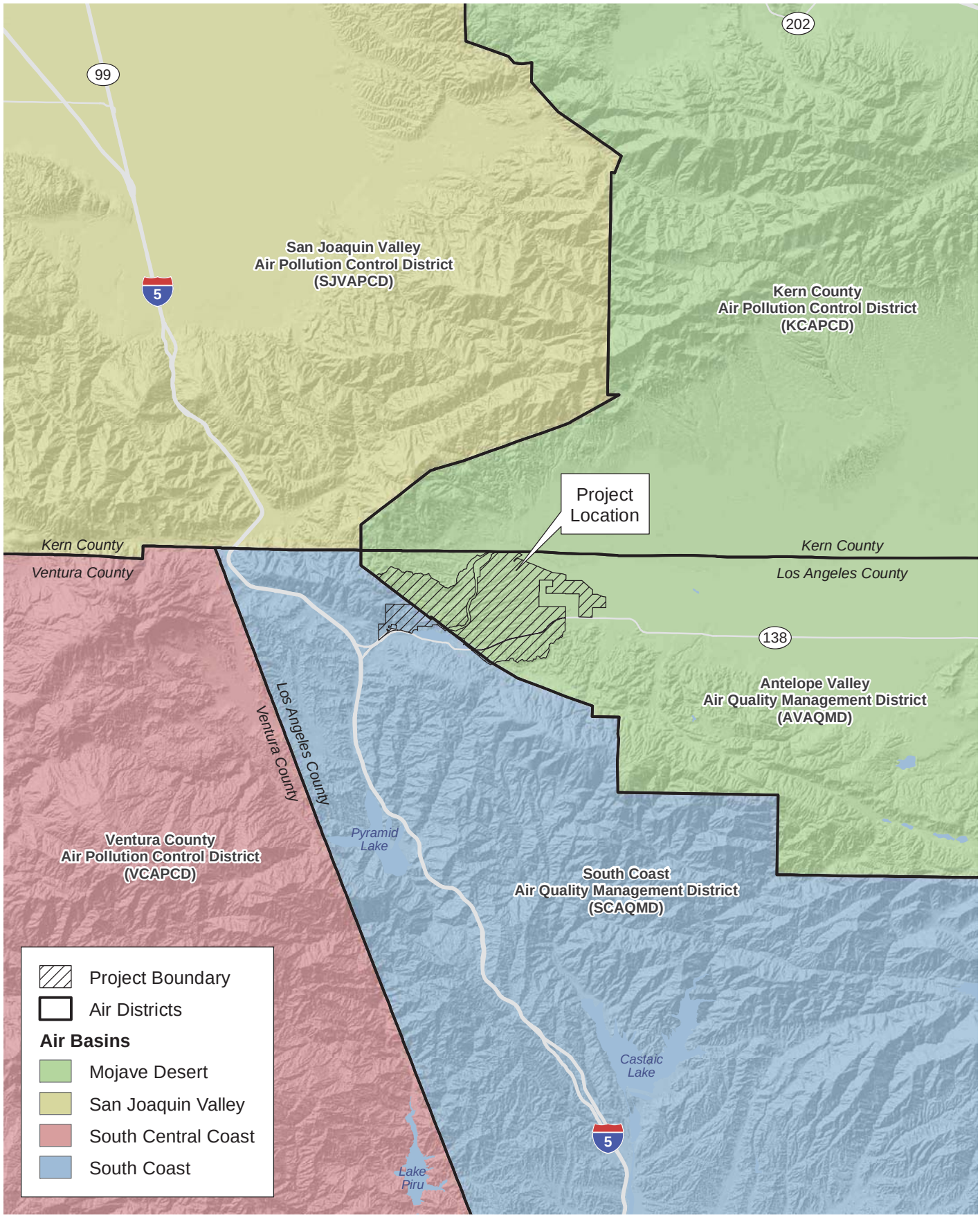
Beyond the mandatory requirements, optional Tier 1 status can be achieved by complying with voluntary measures for energy and water efficiency, material conservation, and other design features. Examples of Tier 1 requirements are 15 percent less energy use in residential construction than required by existing regulations and 12 percent less indoor water use in non-residential construction. Tier 2 status can be achieved by complying with additional voluntary measures; example requirements are 30 percent less energy use in residential construction and 20 percent less indoor water use in non-residential construction.

Regional

Air Quality Management Districts

Air quality management districts are the air pollution control agencies that are responsible for attaining and maintaining State and federal ambient air quality standards in their respective air basin(s). California has been divided into 15 air basins based on similar meteorological and topographical features; these basins are managed by 35 different air quality management districts. As discussed above, each air district maintains a plan, or plans, that detail how State and federal air quality standards shall be met for nonattainment pollutants. Additionally, each air district monitors the air quality in its jurisdiction; issues and enforces permits for sources of pollutants to be constructed and operated; and establishes rules and regulations that govern sources of pollutants.

The Project site lies in two different air districts and two different air basins. The northern 91 percent of the site lies within the boundaries of the AVAQMD, while the remaining 9 percent lies within SCAQMD's boundaries. Since the Project lies within two air quality districts, the guidelines and significance thresholds from both the AVAQMD and SCAQMD are included in the air quality report. Exhibit 5.11-1, Air District and Basin Boundaries,



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Air District and Basin Boundaries

Exhibit 5.11-1

Centennial Project

N W E S

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illustrates the boundaries of these air districts and each air basin in relation to the Project site.

Antelope Valley Air Quality Management District

The AVAQMD was formed in 1997 when the Antelope Valley separated from the jurisdiction of the SCAQMD. The AVAQMD is bound by the Kern County-Los Angeles County border to the north, the Los Angeles County-San Bernardino County border to the east, and the SCAQMD border to the south and southwest. The portion of the site under the jurisdiction of the AVAQMD lies within the Mojave Desert Air Basin (MDAB).

The AVAQMD's current air quality planning documentation, pursuant to SIP and the CCAA requirements applicable at the Project site, includes the following separate documents: the *AVAQMD 2004 Ozone Attainment Plan (State and Federal);* the *AVAQMD List and Implementation Schedule for District Measures to Reduce PM Pursuant to Health & Safety Code §39614(d)*; the *8-Hour Reasonably Available Control Technology – State Implementation Plan Analysis*; the 2014 *8-Hour Ozone Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) Analysis – Supplemental Analysis;* and the *AVAQMD Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area)*. The AVAQMD adopted the 2004 Ozone Plan in response to the designation of the western portions of the MDAB, including the Antelope Valley, as nonattainment areas for the O_3NAAQS and CAAQS and in accordance with the Federal CAA requirement to prepare plans demonstrating attainment. The overall control strategy for the 2004 Ozone Plan is to implement all federal Reasonable Available Control Technology (RACT) rules to reduce O_3 precursors in the Antelope Valley (AVAQMD 2015a, AVAQMD 2015b).

The Antelope Valley has not yet demonstrated attainment status for O_3, largely due to the transport of pollutants from the Los Angeles Basin and San Joaquin Valley. In 2008, the AVAQMD prepared the *Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area)* to replace or update all previously submitted federal ozone plans for the Antelope Valley. The plan (1) demonstrates that the AVAQMD will meet the primary required federal O_3 planning milestones and will attain the 1997 8-hour O_3 NAAQS by June 2021; (2) presents the progress the AVAQMD will make towards meeting all required O_3planning milestones; and (3) discusses the 2008 0.075 part per million (ppm) 8-hour O_3NAAQS, preparatory to an expected nonattainment designation for the new NAAQS.[2] The AVAQMD is not proposing to adopt any additional control measures for direct O_3precursor reduction purposes. However, the AVAQMD is committed to having all applicable Federal RACT rules as specified in the *Federal 8-Hour Ozone Attainment Plan*, and is currently performing analyses on the feasibility of adopting additional rules under the State of California "all feasible measures" mandate, which requires air districts to adopt rules that achieve the maximum degree of O_3precursor emissions reduction, taking into account technology considerations and economic impacts. In addition, the AVAQMD will experience additional future emission reductions from existing and proposed federal and State control measures that affect mobile and area sources. In June 2008, the CARB approved a SIP revision for the Western Mojave Desert Ozone Nonattainment Area; the SIP revision includes the *AVAQMD*

2 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-attainment Area). The SIP revision was submitted to the USEPA in July 2008. As of the preparation of this EIR, the SIP revision has not been approved.

The AVAQMD adopted the *List and Implementation Schedule for District Measures to Reduce PM Pursuant to Health &Safety Code §39614(d)* on August 16, 2005. The list was prepared in response to the code which requires CARB, in consultation with local air pollution management districts, to develop and adopt a list of the most readily available, feasible, and cost-effective control measures that could be employed by CARB and the air districts to reduce PM10 and PM2.5.

South Coast Air Quality Management District

Approximately 9 percent of the Project site is under the jurisdiction of the SCAQMD and lies within the SoCAB. The SCAQMD was established in 1977 by merging the individual air pollution control districts of the four counties within the SoCAB: Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SoCAB is bound on the west by the Pacific Ocean, on the north by the San Gabriel Mountains, on the north and east by the San Bernardino Mountains, on the southeast by the San Jacinto Mountains, and on the south the Santa Ana Mountains. The SoCAB occupies a low plain and the surrounding mountains channel and confine air flow, which traps air pollutants.

The Federal CAA requires the preparation of plans to demonstrate attainment of the NAAQS for which an area is designated as being in nonattainment. Furthermore, the CCAA requires the revision of these plans every three years to address reducing pollutant concentrations that exceed the CAAQS. The SCAQMD and SCAG, in coordination with local governments and the private sector, develop the Air Quality Management Plan (AQMP) for the SoCAB to satisfy these requirements. The AQMP is the most important air management document for the SoCAB because it provides the blueprint for meeting State and federal ambient air quality standards.

On November 28, 2007, CARB submitted a State Implementation Plan (SIP) revision to the USEPA for O_3, PM2.5 (1997 Standard), CO, and NO_2 in the SoCAB. This revision is identified as the "2007 South Coast SIP". The 2007 South Coast SIP demonstrates attainment of the federal PM2.5 standard in the SoCAB by 2014 and attainment of the federal 8-hour O_3 standard by 2023. This SIP also includes a request to reclassify the O_3 attainment designation from "severe" to "extreme". The USEPA approved the redesignation effective June 4, 2010. The "extreme" designation requires the attainment of the 8-hour O_3 standard in the SoCAB by June 2024. CARB approved PM2.5 SIP revisions in April 2011 and the O_3 SIP revisions in July 2011. The USEPA approved the PM2.5 SIP on September 25, 2013, and has approved 47 of the 62 1997 8-hour O_3 SIP requirements (USEPA 2016b). On November 30, 2014, the USEPA proposed a finding that the SoCAB has attained the 1997 PM2.5 standards (USEPA 2014). The comment period closed on January 22, 2015; no subsequent action has been taken.

On September 30, 2015, the USEPA proposed to approve elements of the South Coast 2012 PM2.5 Plan and 2015 Supplement, which addresses Clean Air Act requirements for the 2006 PM2.5 NAAQS, and proposed to reclassify the area as a 'serious' nonattainment area for the

2006 PM2.5 standard. The reclassification is based on the determination that the area cannot practicably attain the 2006 PM2.5 NAAQS by the moderate area attainment date (December 31, 2015). On December 22, 2015, the EPA reclassified the South Coast area as a "Serious" nonattainment area for the 2006 PM2.5 standard. The final reclassification requires the State to submit a "serious area" plan that provides for attainment of the 2006 PM2.5 NAAQS as expeditiously as practicable as and no later than December 31, 2019 (USEPA 2016d).

On December 7, 2012, the SCAQMD adopted the 2012 AQMP, which is a regional and multi-agency effort (SCAQMD, CARB, SCAG, and USEPA). The 2012 AQMP incorporates the latest scientific and technical information and planning assumptions, including SCAG's 2012 *2012–2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS); updated emission inventory methods for various source categories; and SCAG's latest growth forecasts. The primary purposes of the 2012 AQMP are to demonstrate attainment of the federal 24-hour PM2.5 standard by 2014 and to update the USEPA-approved 8-hour Ozone Control Plan. On December 20, 2012, the 2012 AQMP was submitted to CARB and the USEPA for concurrent review and approval for inclusion in the SIP (SCAQMD 2013). The 2012 AQMP was approved by the CARB on January 25, 2013.

The SCAQMD is currently developing the 2016 AQMP. The population projections for this plan include the proposed Project. The Final 2016 AQMP was adopted by the SCAQMD Governing Board on March 3, 2017 (SCAQMD 2017). The 2016 AQMP will develop integrated strategies and measures to meet the following NAAQS (SCAQMD 2016a):

- 8-hour O_3 (75 parts per billion [ppb]) by 2031[3]
- Annual PM2.5 (12 micrograms per cubic meter [µg/m^3]) by 2025
- 8-hour O_3 (80 ppb) by 2023
- 1-hour O_3 (120 ppb) by 2022
- 24-hour PM2.5 (35 µg/m^3) by 2019

Southern California Association of Governments

SCAG is a council of governments for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. As a regional planning agency, SCAG serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG also serves as the regional clearinghouse for projects requiring environmental documentation under federal and State law. In this role, SCAG reviews projects to analyze their impacts to its regional planning efforts.

Although SCAG is not an air quality management agency, it is responsible for several air quality planning issues. As the designated Metropolitan Planning Organization (MPO) for the Southern California region, SCAG partners with local air districts by providing information and/or oversight of air quality planning documentation. Specifically, SCAG provides

3 On October 1, 2015, the USEPA lowered the 8-hour O_3 standard to 0.070 ppm (70 ppb). The SIP (or AQMP) for the 70 ppb standard will be due 4 years after the attainment/non-attainment designations are issued by the USEPA, which is expected next year in 2017. Thus, meeting the 70 ppb standard will be addressed in a 2021 AQMP.

demographic projections as well as integrated land use, housing, employment and transportation programs, measures, and strategies for portions of the South Coast AQMP, which applies to a portion of the Project site. The local air districts develop and enforce regulations for non-vehicular sources of air pollution and coordinate with SCAG to develop and implement Transportation Control Measures (TCMs) to reduce and otherwise improve vehicular travel and associated pollutant emissions.

On April 4, 2012, the SCAG Regional Council adopted the 2012–2035 RTP/SCS, which includes a strong commitment to reduce emissions from transportation sources in order to improve public health; to meet the NAAQS as set forth by the Federal CAA; and to comply with Senate Bill (SB) 375 (SCAG 2012). New to the 2012RTP, SB 375 states that RTPs must include an SCS that reduces greenhouse gas (GHG) emissions from passenger vehicles by 8 percent per capita by 2020 and 13 percent per capita by 2035 compared to 2005 emissions levels. The measures to reduce GHG emissions would also cause reductions in criteria pollutant emissions.

On April 7, 2016, the SCAG Regional Council adopted the 2016–2040 RTP/SCS. The RTP/SCS combines the need for mobility with a "sustainable future" through a reduction in the amount of emissions produced from transportation sources. This would be made through the operation of low or no emission transportation systems by 2040. The 2016 RTP/SCS, like the 2012 RTP/SCS, includes population and housing projections in Traffic Analysis Zone (TAZ) maps for the Project that are consistent with the size and location of the Project, and both the 2012 and 2016 RTP/SCS include corresponding figures that are consistent with the Project.

County

General Plans

Los Angeles County General Plan and Antelope Valley Area Plan

The *County of Los Angeles 2035 General Plan* and *Antelope Valley Area Plan* address air quality issues that affect the County. A consistency analysis of the Project's specific goals and policies with the County's relevant plans, policies and regulations is provided in the Land Use, Entitlements, and Planning Section (Section 5.8) of this document. The AVAP goal and policies applicable to the analysis of air quality with Project implementation are listed below.

Air Quality Goal COS 9: Improved air quality in the Antelope Valley.

> **Policy COS 9.1:** Implement land use patterns that reduce the number of vehicle trips, reducing potential air pollution, as directed in the policies of the Land Use Element.
>
> **Policy COS 9.2:** Develop multi-modal transportation systems that offer alternatives to automobile travel to reduce the number of vehicle trips, including regional transportation, local transit, bicycle routes, trails, and pedestrian networks, as directed in the policies of the Mobility Element.

Policy COS 9.3: In evaluating new development proposals, consider requiring trip reduction measures to relieve congestion and reduce air pollution from vehicle emissions.

Policy COS 9.4: Promote recycling and composting throughout the Antelope Valley to reduce air quality impacts from waste disposal activities and landfill operations.

Policy COS 9.5: Encourage the use of alternative fuel vehicles throughout the Antelope Valley.

5.11.3 METHODOLOGY

Construction and Operational Emissions

Construction and operational emissions were calculated by using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1. CalEEMod is a computer program that is used to calculate anticipated emissions associated with land development projects in California. CalEEMod uses pollutant emission rates from the CARB's Emission FACtor model (EMFAC 2014) for on-road vehicles; CARB's OFFROAD 2014 for construction and material handling equipment; and USEPA formulas for non-vehicular emissions. Where appropriate, emission factors, trip distance, and other data in the model are specific to a county or air basin. The Los Angeles County – Mojave Desert data were used for the Project. The model calculates emissions of the following criteria pollutants: VOC, NOx, CO, SO_2, PM10, and PM2.5.

Specific inputs to CalEEMod for both construction and operations include land uses and acreages associated with the Project. Construction input data include but are not limited to the start and finish dates of construction phases; inventories of construction equipment to be used during each phase; volumes of structures to be demolished; volumes of materials to be imported to and exported from the site; areas to be paved; and areas to be painted. Output emissions data are provided for off-road equipment, on-road vehicles, fugitive dust from grading, and VOCs from asphalt off-gas and architectural coatings.

For the purposes of the air quality modeling assumptions, the Project construction is assumed to begin in 2016, with buildout complete in 2035, although the actual start of construction and buildout are likely to occur later than 2016 and 2035, respectively. The 2035 buildout date is consistent with the Project's Traffic Study (see Section 5.10, Traffic, Access, and Circulation) and also with the CalEEMod model, which does not include operational emissions beyond 2035. For both construction and operational emissions, this is a very conservative approach because both the construction equipment fleet and on-road vehicles are assumed to be "cleaner", that is, to generate less unit emissions, with each future year. As such, assuming development of the Project site occurs sooner than is likely to occur provides a more conservative assessment of both construction and operational emissions.

Operational inputs include the year of analysis and vehicle trip generation rates. Output operational emissions data categories include area, energy, and mobile sources. Area sources are landscape maintenance equipment, consumer products, and architectural coatings used for routine maintenance. Energy emissions are from natural gas consumption. For vehicle

use emissions, traffic data was obtained from the Traffic Study prepared by Stantec (Appendix 5.10-A). The year of analysis for Project buildout is 2035. Average daily trip (ADT) generation rates from the traffic study were entered into the appropriate land use categories in CalEEMod to determine total vehicle trips, vehicle miles traveled, and associated emissions by land use unit type. The Project would generate an estimated 146,154 daily trips at Buildout, with approximately 48 percent (70,246 trips) being internal trips (Stantec 2016). The total estimated weekday Project-generated vehicles miles traveled (VMT) at buildout is 3,438,632 based on the Project-specific internal-external trip proportions (trip types) and average trip distances for the internal and external trips (Stantec 2016). However, the total weekday increase in regional VMT would be 1,921,599 due to changes in regional commuting patterns. The VMT data was used to adjust the CalEEMod trip lengths for consistent VMT results.

The CalEEMod model also includes data to calculate emissions reductions resulting from the implementation of PDFs and mitigation measures (MMs). The methodology for most emissions reductions is based on the August 2010 CAPCOA publication, *Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (CAPCOA 2010). CAPCOA measure LUT-6, documents that trip generation is less for below market rate (affordable) housing. This adjustment to project operational mobile emissions is based on a minimum of 10 percent of the housing being affordable, as stated in PDF 11-5, which is required to be implemented by MM 21-16 of Section 5.21, Climate Change, the Centennial Affordable Housing Implementation Plan.

Ambient Air Quality Standards – Localized Significance Thresholds

The SCAQMD developed a method to assess the localized impacts of criteria pollutant emissions from project sites in close proximity to sensitive receptors. This Localized Significance Threshold (LST) method addresses the thresholds (as listed in Table 5.11-7) for Ambient Air Quality for Criteria Pollutants. There are no corresponding significance thresholds in the AVAQMD's California Environmental Quality Act and Federal Conformity Guidelines (AVAQMD 2016b).

In general, the LST method is a table look-up procedure recommended for projects up to five acres in size. For larger projects, project-specific dispersion modeling is recommended to determine project impacts on surrounding sensitive land uses. Therefore, ENVIRON International Corporation (ENVIRON) conducted a screening-level air dispersion modeling evaluation to estimate ambient air concentrations of criteria pollutants at sensitive receptor locations and compared these estimated concentrations with the CAAQS and NAAQS. The USEPA's Industrial Source Complex, Short Term Version 3 (ISCST3) model with USEPA default settings was used to model air emissions transport.

The SCAQMD recommends selecting the closest site expected to have representative data for meteorological input. Due to its proximity to the proposed development and similar topographic characteristics (Centennial and the chosen site are in the valley formed to the east by the Tehachapi Mountains and San Andreas Rift Zone), the meteorological data from SCAQMD recorded at the Lancaster, California Monitoring Station was assumed appropriate

for this analysis. Selection of model parameters, such as terrain and rural/urban coefficients is discussed in the ENVIRON report included in Appendix 5.11-C of this EIR.

NO_2, PM10, and PM2.5 were evaluated and compared to the CAAQS, the NAAQS, and the SCAQMD's LSTs. NOx emissions were modeled and gradual conversion of emitted NO to NO_2 was assumed (per LST Guidelines). As a conservative assumption for this analysis, 50 percent of NOx were assumed to convert to NO_2 (this approximates a travel distance of 1,000 meters [3,280 feet] downwind according to LST Guidelines). VOC emissions were not modeled as there is no State or federal ambient air quality standard for VOCs. CO was not modeled, as CO impacts tend to be highest for traffic at intersections. Pollutant emission rates for on-site emissions were taken from the calculated daily emissions data for construction activity. Calculation of chemical concentrations requires the selection of appropriate concentration averaging times for comparison to the CAAQS and NAAQS. The maximum 1-hour and annual NOx concentrations were modeled, as well as the maximum 24-hour average and annual PM10 and PM2.5 concentrations. These concentrations, estimated at sensitive receptor locations, were placed every 50 meters (164 feet) along the closest residential, commercial, and institutional boundaries to the construction area.

Carbon Monoxide Hotspot

For localized CO impacts from mobile sources at congested intersections, an appropriate screening procedure is provided in the procedures and guidelines contained in *Transportation Project-Level Carbon Monoxide Protocol* (the Protocol) to determine whether a project poses the potential for a CO hotspot (UCD ITS 1997). If it is determined that a quantitative analysis is required, the Protocol methods are not used because of emission factors that are outdated. Potential local CO impacts were evaluated by comparing projected traffic conditions with the CO analysis in the SCAQMD's 2003 AQMP.

Exposure to Toxic Air Contaminant Emissions

At this time, neither the AVAQMD nor the SCAQMD has adopted a quantitative methodology for analyzing short-term construction-related emissions of TACs and/or the exposure thereof. Therefore, Project-generated, construction-related emissions of TACs were assessed in a qualitative manner.

Stationary Sources

The total mass emissions of VOC, NOx, PM, and CO generated by potential stationary sources were calculated by ENVIRON based on the limitations on such sources imposed in MM 11-1 (which requires the implementation of PDF 11-1). The stationary sources addressed in the analysis include boilers, emergency generators, spray booths, restaurant broilers, gasoline service stations, solvent storage tanks, small source PM-generators, and dry cleaners. These constitute and/or represent the majority of stationary sources for the wide variety of land uses allowed by the Project. The VOC emissions from proposed wastewater reclamation facilities were also addressed. A detailed description of the methods applied in the stationary source air quality analysis is provided in the ENVIRON Report included in Appendix 5.11-B of this EIR.

Toxic Air Contaminants

The ENVIRON Stationary Sources Report (Appendix 5.11-B) evaluates the Project's anticipated business park stationary source emissions of TACs to determine whether the incremental risks posed to sensitive receptors (e.g., residents, schools, hospitals, parks) by such stationary sources would exceed the applicable significance thresholds (i.e., has a cancer risk greater than or equal to 10 in 1 million for cancer risks and 1.0 for non-cancer chronic and acute HIs). Although the ENVIRON Stationary Sources Report analyzed TACs based on data from 2008, there have been no substantial changes to information related to TACs, and the analysis remains relevant. Because it is possible that two stationary sources that are located in proximity to each other may result in incremental risks greater than these thresholds, a Project-wide analysis of TAC emissions was completed.

The TAC analysis includes a multi-step risk characterization to quantify the potential for adverse health effects as a result of site-specific exposures to emissions and an evaluation of TACs in commercial, institutional, and residential areas to confirm, with the designation of appropriate buffer areas, that the aggregate incremental cancer and non-cancer health risks from these TAC-emitting sources would be below significance thresholds. A description of the methodology for these analyses is provided in the Appendix 5.11-B.

For TAC-emitting sources in commercial, institutional and residential areas, modeling was conducted to confirm that limitations on equipment types and sizes imposed by MM 11-1 will ensure that the incremental long-term risks posed by each individual source would be less than significant at the maximum point of impact. To account for the possibility of impacts at one receptor from more than one source, the limitations for each individual source are based on a standard at one-tenth of the applicable standard. This is described in more detail in Appendix 5.11-B. In addition, a screening health risk assessment for the wastewater reclamation facilities (WRFs) was conducted using ISCST3 to evaluate the air concentration at the nearest sensitive receptors and the incremental cancer and non-cancer health risks at the maximally exposed receptor location.

Diesel Particulate Matter

ENVIRON conducted a screening evaluation to estimate the health risk to sensitive receptors associated with diesel PM emissions within 500 feet of SR-138 (based on recommended default separation distances) when locating new sensitive land uses near sources of TACs, including freeways (Appendix 5.11-C). The CARB guidance manual provides recommended buffers between freeways and sensitive receptors of 500 feet, indicating that further analyses may be in order if the proposed sensitive land use is located within this recommended buffer. According to the CARB, sensitive receptors include residences, schools, day care centers, playgrounds (e.g., parks or community areas), and medical facilities.

ENVIRON used CAL3QHCR, a steady-state Gaussian dispersion model, to estimate diesel PM concentrations at sensitive receptors (e.g., existing and planned future residences and locations which could contain schools or hospitals according to the proposed land use plan) located in proximity to SR-138. Diesel PM concentrations were calculated for "With Project" and "Without Project" scenarios.

Two configurations of SR-138 were evaluated: (1) the current configuration, assuming it will not change if the Project is not completed and (2) a realigned and expanded configuration, consistent with the proposed Northwest 138 Corridor Improvement Project. In addition to the locations of potential future sensitive receptors within 500 feet of the freeway, 3 existing residences were identified and were evaluated as discrete receptors.

Cancer risks were calculated for the modeled sensitive receptors assuming Office of Environmental Health Hazard Assessment-recommended (OEHHA-recommended) exposure parameters and toxicity using a 30-year exposure duration, which represents a high-end residency period. Additionally, a 70-year exposure scenario was estimated per OEHHA parameters under their Air Toxics Hot Spots Program (Assembly Bill 2588) to represent a maximum, lifetime exposure.

5.11.4 ENVIRONMENTAL SETTING

Climate and Meteorological Conditions

The climate in and around the Project area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and it limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, except in the summer months, which commonly bring substantially higher temperatures.

The Project site is located in the southern foothills of the Tehachapi Range at its confluence with the Coast Range (west of the Project site) and Sierra Pelona Range (south of the Project site). From the area where these ranges join, a series of Coast Range mountains extend southeastward to California's southern border. The Tehachapi and Coast ranges form a barrier separating the San Joaquin Valley to the north and the Mojave Desert to the east. Similarly, the Sierra Pelona range forms a barrier separating the Mojave Desert to the east from the Santa Clarita Valley and Los Angeles metropolitan area to the south. West of the Coast Range are coastal areas with a predominantly maritime climate, while to the east a continental desert regime prevails. The Project site is located within the transitional zone between these two climate regimes and is considered a temperate climate with cool temperatures and moderate precipitation during the winter and warm, dry summers.

In the winter, when the Pacific high moves south, cool, moist air moves through the region from the north and west. As the air mass is forced above the Tehachapi and Coast ranges, precipitation occurs in the form of rain and episodic hail and/or snow. In the summer, when the Pacific high moves north, most storms are deflected far to the north, and storms from the Gulf of Mexico dissipate before reaching the Project region. These conditions result in warm, dry summers. Temperatures in the area rarely exceed 100 degrees Fahrenheit (°F) in the summer or drop below 20°F in the winter. The average annual temperature measured on Tejon Ranch from 2012 through 2014 was 67°F (WRCC 2015). Average annual precipitation measured on the Tejon Ranch from 2012 through 2014 was 8.05 inches (WRCC 2015).

The San Joaquin Valley's topography has a dominating effect on wind patterns in the Tejon Pass and on the Tejon Ranch. Winds tend to blow from the north somewhat parallel to the valley and mountain range orientation, generally in the winter; however, in the summer when low-pressure systems in the Great Basin form and the Pacific high moves northward, strong winds out of the northwest will also occur.

Air Quality Attainment Designations

Based on monitored air pollutant concentrations, the USEPA and the CARB designate an area's status in attaining the NAAQS and CAAQS, respectively, for the criteria pollutants identified in Table 5.11-1. The Federal CAA specifies dates for achieving compliance with the NAAQS and mandates that States develop SIPs to manage the attainment, maintenance, and enforcement of the NAAQS. Similarly, the CARB requires air districts to prepare plans showing how the area would meet the CAAQS by its attainment dates for all areas designated as being in nonattainment, and these plans become part of California's SIP. The attainment status for the AVAQMD portion of the MDAB and the SoCAB are summarized below. The CARB has not published attainment designations for vinyl chloride.

Antelope Valley Air Quality Management District Attainment Designations

Table 5.11-2, Designations of Criteria Pollutants in The Antelope Valley Portion of The Mojave Desert Air Basin, lists the current attainment designations for the MDAB. The USEPA designates an area as "unclassifiable" if, based on available information, it cannot be classified as either meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant. For the CARB, an "unclassified" designation indicates that the air quality data for the area are incomplete and do not support a designation of attainment or nonattainment.

Table 5.11-2 shows that the USEPA has designated the AVAQMD portion of MDAB as being in "severe-15 nonattainment" for ambient O_3 concentrations. Pursuant to the approved *2008 Federal Ozone Attainment Plan* and given the "severe-15 nonattainment" designation, the AVAQMD has 15 years from the 2004 plan approval (year 2019) to achieve attainment. To be designated as an "attainment" area by the State, the AVAQMD portion of the MDAB will need to achieve both the one-hour and eight-hour O_3 standards.

The USEPA has designated the AVAQMD portion of the MDAB as being an "unclassifiable" area for PM10. The State has designated the AVAQMD portion of the MDAB as being in "nonattainment" for the State PM10 standard.

TABLE 5.11-2
DESIGNATIONS OF CRITERIA POLLUTANTS IN THE ANTELOPE VALLEY PORTION OF THE MOJAVE DESERT AIR BASIN

Pollutant	Attainment Status	
	State	Federal
O_3 (1 hour)	Nonattainment; classified Extreme	No standard
O_3 (8 hour)		Nonattainment; classified Severe-15
PM10	Nonattainment	Unclassifiable/Attainment[a]
PM2.5	Unclassified	Unclassifiable/Attainment
CO	Attainment	Attainment
NO_2	Attainment	Unclassifiable/Attainment
SO_2	Attainment	Unclassifiable/Attainment
Lead	Attainment	Unclassifiable/Attainment
Particulate Sulfate	Unclassified	No federal standard
Hydrogen Sulfide	Unclassified	
Visibility Reducing Particles	Unclassified	

O_3: ozone; PM10: respirable particulate matter with a diameter of 10 microns or less in diameter; PM2.5: fine particulate matter with a diameter of 2.5 microns or less in diameter; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide.

[a] If the air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area (designated "unclassifiable/attainment"); areas that don't meet the national standard are called nonattainment areas. In some cases, EPA is not able to determine an area's status after evaluating the available information. Those areas are designated "unclassifiable."

Source: AVAQMD 2016b; USEPA 2016c.

South Coast Air Quality Management District Attainment Designations

Table 5.11-3, Designations of Criteria Pollutants in the South Coast Air Basin, lists the current attainment designations for the SoCAB. As shown, the SoCAB is a nonattainment area for PM10 (State), PM2.5 (State and Federal), and O_3 (State and Federal).

Table 5.11-3 shows that the USEPA has designated the SoCAB as an "extreme nonattainment" area for O_3, a "nonattainment" area for PM10, a "moderate nonattainment" area for PM2.5, and an "attainment/maintenance" area for CO and NO_2; the Los Angeles County portion of the SoCAB is designated as a "nonattainment" area for lead. For the federal designations, the qualifiers (i.e., "extreme" and "moderate") affect the required attainment dates as the federal regulations have different requirements for areas that exceed the standards by greater amounts at the time of the attainment/nonattainment designation. The State has designated the SoCAB as being in "nonattainment for"O_3, PM10, and PM2.5.

TABLE 5.11-3
DESIGNATIONS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

Pollutant	State	Federal
O_3 (1 hour)	Nonattainment	No standard
O_3 (8 hour)		Nonattainment – Extreme
PM10	Nonattainment	Attainment/Maintenance
PM2.5	Nonattainment	Nonattainment – Moderate[a]
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Attainment/Nonattainment[b, c]
Particulate Sulfate	Unclassified	No federal standard
Hydrogen Sulfide	Unclassified	
Visibility Reducing Particles	Unclassified	

O_3: ozone; PM10: respirable particulate matter 10 microns or less in diameter; PM2.5: fine particulate matter 2.5 microns or less in diameter; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; USEPA: U.S. Environmental Protection Agency; SoCAB: South Coast Air Basin; CARB: California Air Resources Board.

[a] On November 30, 2014, the USEPA proposed a finding that the SoCAB has attained the 1997 PM2.5 standards. If approved, the SoCAB would remain a nonattainment area for the 2006 PM2.5 standard. On September 30, 2015 the USEPA proposed a reclassification from Moderate to Serious for the 2006 PM2.5 standard.

[b] Los Angeles County is classified as "nonattainment" for lead; the remainder of the SoCAB is in attainment of the federal standard.

Source: CARB 2015, 2014; USEPA 2016c.

The SoCAB is designated as being in attainment of the federal SO_2 and lead NAAQS (except Los Angeles County) as well as the State CO, SO_2, lead (except Los Angeles County), hydrogen sulfide, and vinyl chloride CAAQS.

Monitored Air Quality

Air quality at any site is dependent upon regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin and transport of pollutants from other air basins.

Air quality data for the Project region was collected at the Lancaster and Santa Clarita Monitoring Stations. The Lancaster Monitoring Station is approximately 33 miles east of the Project site, located at 43301 Division Street in Lancaster. The Santa Clarita Monitoring Station is approximately 29 miles southeast of the Project site, located at 22224 Placerita Canyon Road in Santa Clarita. Both stations were included for this analysis because, although the Santa Clarita Monitoring Station is closer in proximity to the Project site, the Lancaster

Monitoring Station is more representative of data from the Mojave Desert Air Basin, which is where most of the Project site is located.

As shown in Table 5.11-4, Air Quality Levels Measured at the Lancaster and Santa Clarita Monitoring Stations, the Lancaster monitoring data show that O_3 is the air pollutant of primary concern in the Project area. At the Lancaster Monitoring Station, the State 1-hour O_3 standard was exceeded 9 days in 2013, 3 days in 2014, and 26 days in 2015. The State 8-hour O_3 standard was exceeded 50 days in 2013, 35 days in 2014, and 80 days in 2015. The federal O_3 8-hour standard was exceeded 34 days in 2013, 17 days in 2014, and 53 days in 2015. O_3 is a secondary pollutant and is not directly emitted from a source; it occurs as the result of chemical reactions between other pollutants, most importantly VOCs and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Because NO_2 is a primary constituent of O_3, the very low measured concentrations of NO_2 indicate that existing high O_3 levels are primarily the result of transport of O_3 that is formed outside the Antelope Valley.

Particulate matter (PM10 and PM2.5) is another air pollutant of concern in the area. The State 24-hour PM10 standard was exceeded for 2 days in 2013 at the Lancaster Monitoring Station. The federal 24-hour PM2.5 standard was exceeded for 1 day in 2014. No other PM10 or PM2.5 standards were exceeded from 2013 to 215. Particulate levels in the area are due to natural sources (such as wind), grading operations, and motor vehicles.

TABLE 5.11-4
AIR QUALITY LEVELS MEASURED AT THE LANCASTER AND SANTA CLARITA MONITORING STATIONS

Pollutant	California Standard	National Standard	Year	Max. Level[a]	Days State Standard Exceeded[b]	Days National Standard Exceeded[b, c]
Lancaster Monitoring Station						
O_3 (1 hour)	0.09 ppm	None	2015	0.132	26	1
			2014	0.101	3	0
			2013	0.108	9	0
O_3 (8 hour)	0.070 ppm	0.070 ppm	2015	0.103	80	53
			2014	0.087	35	17
			2013	0.093	50	34
PM10 (24 hour)	50 µg/m³	150 µg/m³	2015	–	–/–	0/–
			2014	–	–/–	0/0
			2013	173.4	2/–	0/–
PM10 (AAM)	20 µg/m³	None	2015	–	–	N/A
			2014	–	–	N/A
			2013	–	–	N/A
NO_2 (1 Hour)	0.18 ppm	0.100 ppm	2015	–	–	–
			2014	0.051	0	0
			2013	0.047	0	0

TABLE 5.11-4
AIR QUALITY LEVELS MEASURED AT THE LANCASTER AND SANTA CLARITA MONITORING STATIONS

Pollutant	California Standard	National Standard	Year	Max. Level[a]	Days State Standard Exceeded[b]	Days National Standard Exceeded[b, c]
NO_2 (AAM)	0.030 ppm	0.053 ppm	2015	–	–	–
			2014	0.008	No	No
			2013	0.008	No	No
CO (8 hour)	9.0 ppm	9.0 ppm	2015	–	0	0
			2014	–	0	0
			2013	–	0	0
PM2.5 (24 Hour)	None	35 µg/m³	2015	10.4	N/A	0/–
			2014	42.0	N/A	1/6.9
			2013	11.9	N/A	0/0
PM2.5 (AAM)	12 µg/m³	15 µg/m³	2015	–	–	–
			2014	7.2	No	No
			2013	5.8	No	No
Santa Clarita Monitoring Station						
O_3 (1 hour)	0.09 ppm	None	2015	0.126	23	N/A
			2014	0.137	32	N/A
			2013	0.134	30	N/A
O_3 (8 hour)	0.070 ppm	0.070 ppm	2015	0.108	52	37
			2014	0.110	64	45
			2013	0.104	57	40
PM10 (24 hour)	50 µg/m³	150 µg/m³	2015	39.0	0/0	0/0
			2014	45.0	0/0	0/0
			2013	41.0	0/0	0/0
PM10 (AAM)	20 µg/m³	None	2015	–	–	N/A
			2014	22.1	–	N/A
			2013	20.6	–	N/A
NO_2 (1 Hour)	0.18 ppm	0.100 ppm	2015	0.065	0	0
			2014	0.058	0	0
			2013	0.065	0	0
NO_2 (AAM)	0.030 ppm	0.053 ppm	2015	0.011	No	No
			2014	0.012	No	No
			2013	0.014	No	No
CO (8 hour)	9.0 ppm	9.0 ppm	2015	–	0	0
			2014	–	0	0
			2013	–	0	0
PM2.5 (24 Hour)	None	35 µg/m³	2015	34.4	N/A	–
			2014	28.9	N/A	–
			2013	29.5	N/A	–

TABLE 5.11-4
AIR QUALITY LEVELS MEASURED AT THE LANCASTER AND SANTA CLARITA MONITORING STATIONS

Pollutant	California Standard	National Standard	Year	Max. Level[a]	Days State Standard Exceeded[b]	Days National Standard Exceeded[b, c]
PM2.5 (AAM)	12 µg/m^3	15 µg/m^3	2015	–	–	–
			2014	–	–	–
			2013	–	–	–

O_3: ozone; ppm: parts per million; PM10: respirable particulate matter with a diameter of 10 microns or less; µg/m^3: micrograms per cubic meter; AAM: annual arithmetic mean; NO2: nitrogen dioxide; CO: carbon monoxide; PM2.5: fine particulate matter with a diameter of 2.5 microns or less

"–" indicates that the data are not reported or there is insufficient data available to determine the value. N/A indicates that there is no applicable standard.

a California maximum levels were used.
b For annual averaging times, a "Yes" or "No" response is given if the annual average concentration exceeded the applicable standard.
c PM is measured once every 6 days. Where 2 values are shown for PM10 and PM2.5, the first is for the measured value, and the second is the estimated value if monitored every day.

Source: CARB 2017

The air pollutants measured at the Santa Clarita Monitoring Station include O_3, PM10, NO_2, CO, and PM2.5. The Santa Clarita monitoring data show that O_3 is the air pollutant of primary concern in the Project area. At the Santa Clarita Monitoring Station, the State 1-hour O_3 standard was exceeded 30 days in 2013, 32 days in 2014, and 23 days in 2015. The State 8-hour O_3 standard was exceeded 57 days in 2013, 64 days in 2014, and 52 days in 2015. The federal O_3 8-hour standard was exceeded 40 days in 2013, 45 days in 2014, and 37 days in 2015.

No State or federal standards were exceeded for the remaining criteria pollutants monitored. Furthermore, because NO_2 is a primary constituent of O_3, the very low measured concentrations of NO_2 indicate that existing high O_3 levels are primarily the result of transport of O_3 that is formed outside the Antelope Valley.

Valley Fever

Valley Fever is the common name (formally known as *Coccidioidomycosis*) for a fungal disease caused by inhalation of *Coccidioides immitis* spores that are carried in dust. In California, the highest incidence of Valley Fever occurs in the San Joaquin (Central) Valley, with over 75 percent of reported cases (CDPH 2016). Valley Fever tends to occur in areas with dry dirt and desert-like weather conditions that can allow the fungus to grow. The fungus is found throughout Los Angeles County, with the highest rates in the San Fernando Valley and Antelope Valley (LADPH 2015).The fungus can become airborne when soil that contains *C. immitis* spores is disturbed, either by natural or anthropogenic (man-made) means, including wind, farming, and construction. Valley Fever is diagnosed by a blood test, a chest x-ray, and other tests, and can be treated with anti-fungal medications. Approximately 60 percent of people exposed to Valley Fever spores develop no symptoms.

If symptoms develop, those individuals generally develop a mild respiratory illness with flu-like symptoms that can last a month or more. Rarely, individuals develop a severe illness such as pneumonia, meningitis, or dissemination when the fungus spreads to other parts of the body. African Americans, Filipinos, pregnant women, children under 5 years of age, the elderly, and immunocompromised individuals are at higher risk for severe disease (LADPH 2016).At highest risk for exposure to Valley Fever are farmers, construction workers, military personnel, archaeologists, and others who are likely to engage in activities that actively disturb soils in areas where Valley Fever may be present.

A more thorough discussion of Valley Fever, including applicable PDFs and MMs is discussed in Section 5.3, Hazards and Fire Safety.

Toxic Air Contaminants

As described in Section 2.0, Environmental Setting, the Project site and surrounding areas remain in a relatively rural and undeveloped condition. As such, there are very few existing sources of TACs. The National Cement Company of California's (NCCC) Lebec Cement Kiln, located more than one mile north of the Project site, was identified as a potential stationary source of TACs in the vicinity of the Project site. Additionally, freeways in the vicinity of the Project site, including SR-138 and Interstate (I) 5, experience daily vehicle traffic that includes diesel trucks and buses considered mobile sources of diesel particulate matter. Both existing and proposed sources of toxic air contaminants have been considered in the air quality analysis below.

Sensitive Receptors

Certain groups of people are more sensitive to airborne pollutants, such as the elderly, children, and persons with respiratory illnesses or impaired lung function because of other illnesses. Sensitive receptors are land uses that provide facilities and/or structures where these sensitive persons live or spend considerable amounts of time. These land uses include, but are not limited to, schools, school yards, day care facilities, hospitals, rest homes, long-term medical facilities, and parks/playgrounds. Residences are also considered to be sensitive receptors because of their potential to contain children and the elderly.

The nearest existing sensitive receptors to the Project site are residential properties near the Project site boundaries on 300th Street West, 290th Street West, and Malinda Avenue. Additional nearby residences include one located offsite on the south side of SR-138 west of Cement Plant Road and homes between the Quail Lake Sky Park runway and SR-138. The residences, schools, and parks to be built as part of the Project would also be sensitive receptors. Both existing and proposed sensitive receptors on and around the Project site have been considered in the air quality analysis below.

5.11.5 PROJECT DESIGN FEATURES

The emission savings from the Project Design Features (PDFs) listed below are quantifiable, and these emissions reductions have been estimated and are described in the analyses below where feasible. Each PDF listed below has a corresponding MM to ensure implementation since there are quantifiable reductions in emissions associated with each PDF.

PDF 11-1 The Project requires stationary sources to comply with ambient air quality standards and the toxic air contaminant (TAC) emissions thresholds by requiring compliance with the parameters stated in Table 5.11-5, Stationary Source Types, Size Limits, and Quantity Estimates. Should there be a need or request for a stationary source exceeding the prescribed limits, a source-specific air quality analysis in accordance with the applicable Antelope Valley Air Quality Management District (AVAQMD) or South Coast Air Quality Management District (SCAQMD) Rules would be required.

PDF 11-2 The Green Development Program requires compliance with the California Green Building Standards (CALGreen) Code voluntary measure A5.203.1.2.1 for non-residential buildings. Therefore, the energy efficiency of nonresidential, hotel, and high-rise residential buildings would exceed 2016 Title 24 requirements by 10 percent.

PDF 11-3 The Green Development Program requires compliance with CALGreen voluntary measure A4.203.1.2.1 for low-rise residential buildings. Therefore, the energy efficiency of these buildings would exceed 2016 Title 24 requirements by 15 percent.

PDF 11-4 The Project prohibits wood-burning fireplaces. The elimination of wood burning avoids the potential emissions of substantial quantities of respirable particulate matter with a diameter of 10 microns or less (PM10), fine particulate matter with a diameter of 2.5 microns or less (PM2.5), nitrogen oxides (NOx), and volatile organic compounds (VOCs). This PDF extends SCAQMD Rule 445, Wood-Burning Devices, to the entire Project area and to developments at 3,000 or more feet above mean sea level, and applies the requirements and exemptions of SCAQMD Rule 445, with the exception that the exemption for locations at 3,000 or more feet above mean sea level is not applicable. The maximum number of non-wood burning fireplaces will be 13,954, the equivalent of 1 fireplace for each single-family residence.

PDF 11-5 The Centennial Affordable Housing Implementation Plan (see Appendix 3-H of the *Centennial Specific Plan,* which is in Appendix 4.0-A of this EIR) will be adopted in conjunction with the Project, which includes dedication of a minimum of ten percent of the residential units as affordable housing. A range of employment opportunities will be created within the community; therefore, a range of housing needs will be provided to reduce the number of vehicle trips (particularly long trips outside the Project).

PDF 11-6 The Project prohibits residences, schools, day care centers or other land uses involving public congregation from being be built within 150 feet of the near edge of the State Route (SR) 138 traffic lanes. This requirement will ensure that the risk of exposure to diesel particulate matter (diesel PM) is less than what is allowed by AVAQMD and SCAQMD guidelines.

TABLE 5.11-5
STATIONARY SOURCE TYPES, SIZE LIMITS, AND QUANTITY ESTIMATES

Source Type	Description	Maximum Single Source Size/ Configuration[a]	Project-wide Representative Estimate[b]	Assumed Average Size of Single Source	Number of Sources[c]	Notes
Boiler	Includes general purpose heating for schools, hospitals, commercial buildings, light industrial uses. Does not include industries such as large scale chemical or pharmaceutical manufacturing, large scale agricultural processing plants or breweries (i.e., heat-intensive processes).	58 mmbtu/hr per boiler	700 mmbtu/hr	25 mmbtu/hr	28	A 25 mmbtu/hr boiler is typical for a large hospital and is larger than approximately 70% of the boilers permitted in the SJVAPCD; the Project-wide estimate is based on 28 boilers at average size.
Emergency Generator	Used for emergency back-up power at schools, hospitals, commercial buildings, light industrial uses, cell phone towers, etc.	1,000 hp per generator (Tier 4 Final engine)	12,800 hp	200 hp	64	In the SJVAPCD, the median generator size is 200 hp, and 92% of permitted generators are smaller than 1000 hp (1999); the Project-wide estimate is based on 64 generators of average size. A Tier 4 Final engine is not required to meet the threshold provided the total emissions are lower than those from 1000 hp Tier 4 Final engine operating for 9 hours per year.

TABLE 5.11-5
STATIONARY SOURCE TYPES, SIZE LIMITS, AND QUANTITY ESTIMATES

Source Type	Description	Maximum Single Source Size/ Configuration[a]	Project-wide Representative Estimate[b]	Assumed Average Size of Single Source	Number of Sources[c]	Notes
Restaurant with Charbroilers	Includes fast food restaurants such as McDonalds and Wendy's; steakhouses and other restaurants with charbroilers, such as Applebees or TGIFriday's; and school cafeterias. Does not include cafés, small sandwich shops, and fine dining restaurants without charbroilers.	775 lbs of meat throughput per day per restaurant	13,750 lbs of meat per day	250 lbs of meat per day	55	SCAQMD indicates average beef usage of 233 lbs per day; the Project-wide estimate is based on 55 restaurants of assumed average size.
Spray Booths	Includes small-scale auto detailing, furniture repair and refinishing, antique refurbishing, and other small scale paining activities. Does not include industries such as vehicle manufacturing, dye production, composite manufacturing, industrial drum refurbishing (i.e., large-scale solvent or paint use).	VOC emissions up to 667 lbs per month per spray booth	VOC emissions up to 13,340 lbs per month	VOC emissions up to 667 lbs per month per spray booth	20	Typical small-scale permit based on SCAQMD permits in Santa Clarita; the Project-wide estimate is based on 20 units of this size.
Gas Stations	Includes all fuel-dispensing facilities.	CARB specifies setback distances	Project-wide throughput of 28.4 MG per year	2.4 MG per year throughput	Project-wide throughput of 28.4 MG per year	CARB reports that 96% of gas stations in California are smaller than 2.4 MG per year throughput. A large gas station (e.g., Costco) has a throughput around 9 MG per year. The Project-wide estimate is based on the assumption that Centennial will have 65,000 drivers logging national average vehicle miles traveled in cars with national average fuel efficiency.

TABLE 5.11-5
STATIONARY SOURCE TYPES, SIZE LIMITS, AND QUANTITY ESTIMATES

Source Type	Description	Maximum Single Source Size/ Configuration[a]	Project-wide Representative Estimate[b]	Assumed Average Size of Single Source	Number of Sources[c]	Notes
Storage Tanks (non-fuel dispensing)	Includes most light-industrial uses such as small-scale personal-care product manufacturing and other small users. Does not include storage tanks for gasoline-dispensing facilities (included above) or oil production equipment and refineries.	<20,000 gallons per storage tank	560,000-gallon capacity	10,000 gallons	56	A survey of SCAQMD permits for Santa Clarita indicated that no permitted tank (for all uses, including fuel distribution) was larger than 20,000 gallons. The Project-wide estimate is based on 56 non-gasoline dispensing tanks that are all the average size of 10,000 gallons.
Other VOC-emitting sources	Includes film-processing facilities; oil-water separators at auto repair facilities; and soil and groundwater remediation systems.	VOC emissions up to 4 tons per year per VOC source	VOC emissions up to 80 tons per year	VOC emissions up to 4 tons per year per VOC source	20	This is the assumed estimate for miscellaneous sources. The Project-wide estimate is based on 20 miscellaneous sources.
Small Source PM-emitting sources	Includes auto repair, metal fabrication and finishing, swimming pool supply, and repair shops.	PM emissions up to 1 lb per day per PM source. The source shall be no closer than 25 feet from the property boundary.	PM emissions up to 23 lbs per day	PM emissions up to 1 lb per day per PM source	23	This is the assumed estimate for miscellaneous sources. The Project-wide estimate is based on 23 miscellaneous sources.
On-site Petroleum Solvent Dry Cleaning	Includes on-site dry cleaning of clothing. Does not include store-front dry cleaning shops with no on-site cleaning (i.e., cleaning sent to another location).	N/A	2,400 gallons of solvent usage per year	100 gallons of solvent usage per year	24	The average usage for petroleum-based drycleaner is 89 gallons of solvent consumed per year. The Project-wide estimate is based on an average use estimate of 100 gallons and 24 dry cleaners in Centennial.

TABLE 5.11-5
STATIONARY SOURCE TYPES, SIZE LIMITS, AND QUANTITY ESTIMATES

Source Type	Description	Maximum Single Source Size/ Configuration[a]	Project-wide Representative Estimate[b]	Assumed Average Size of Single Source	Number of Sources[c]	Notes
TAC-emitting Stationary Sources in Non-Buffer Areas of Business Parks	Includes all potential stationary sources of TACs in non-buffer areas of business parks. Does not include large scale industrial sources (such as foundries or refineries).	Calculated cancer risk of 10 in 1 million at facility boundary	N/A	N/A	N/A	Non-buffer areas of business parks; see Figure 2-3 in Appendix 5.11-B.

mmbtu/hr: million British thermal units per hour; SJVAPCD: San Joaquin Valley Air Pollution Control District; hp: horsepower; lb: pound; SCAQMD: South Coast Air Quality Management District; VOC: volatile organic compound; CARB: California Air Resources Board; MG: million gallons; PM: particulate matter; N/A: not applicable; TAC: toxic air contaminant

[a] This is the maximum in order to not exceed ambient air quality standards and/or risk thresholds. A larger source could potentially be operated without exceeding ambient air quality and/or risk standards, but would require further evaluation.

[b] The amount was arrived at by multiplying the assumed average source size/configuration by the representative number of sources expected to locate in Centennial.

[c] Representative Number of Sources in Centennial Based on Demand Projections.

Source: ENVIRON 2009a

The Project incorporates important characteristics or elements that are quantified and accounted for in the modeling for the Traffic Study, and that would minimize air quality impacts, as summarized in Section 5.10, Traffic, Access and Circulation. The location of the Project and the proposed residential and non-residential uses have been planned for a balance between the number of jobs available and the number of on-site housing units in an effort to encourage local trips. The approximate 10.1 million square feet (sf) of commercial office, shopping center, and industrial land uses will provide approximately 20,809 jobs, many of which are anticipated to be filled by future Centennial residents and would result in trips that are "internal" to the Project site.

Some Centennial residents will be commuting to jobs outside the community and some residents from surrounding areas will commute to Centennial for employment. The Centennial Traffic Study forecasts that around 48 percent of the average daily trips will be internal (Stantec 2016). This is a substantially greater amount of internal trips than would be anticipated in a development with less residential/non-residential balance. The result is a reduction in vehicle miles traveled (VMT) and the associated air pollutant emissions. This internal capture of trips is quantified in the Traffic Study, which is used as a component of the operational emissions calculated by CalEEMod Version 2016.3.1.

5.11.6 THRESHOLD CRITERIA

Air quality impacts are usually classified as short term and/or long term. Short-term (or temporary) impacts are usually the result of construction or grading operations. Long-term impacts are associated with a project's emissions from the proposed land uses in their built-out condition. This analysis addresses "criteria" pollutants (the contaminants for which ambient air quality standards have been established) and TACs.

Ambient concentrations of criteria pollutants are monitored throughout the state and nation to determine the general acceptability of the air environment. When ambient air quality standards are exceeded, measures (which are often regional in nature) are implemented to reduce concentrations. Based primarily on measured ambient concentrations, emissions inventories, and projected emissions activities, air quality management districts determine maximum emissions values, applicable to all projects, that would not likely cause or contribute to a new violation of air quality standards; increase the frequency or severity of existing violation(s); and/or delay attainment of an air quality standard or other requirement of the federal attainment plan.

At the local level, pollutant concentrations may be analyzed to ensure that sensitive receptors (e.g., residences, schools, hospitals, and parks) are not subjected to ambient concentrations in excess of State or federal standards as a result of a project's construction or operation. A pollutant emissions inventory and dispersion modeling effort is often required for larger projects to determine project-specific effects on ambient concentrations in surrounding areas with sensitive receptors.

An analysis of TACs is intended to characterize the potential incremental health risks (both cancer and non-cancer) associated with anticipated long-term ambient concentrations resulting from site-specific exposure to emissions sources. TAC analyses use the results from the dispersion modeling to determine expected incremental exposure and dosage of toxic

contaminants for each receptor. The toxicity information for each TAC is then combined with the expected dosages of respective TACs to determine the potential incremental health risk at a particular location.

California Environmental Quality Act Thresholds

The following significance threshold criteria are derived from the County of Los Angeles Environmental Checklist. The Project would result in a significant impact if it would:

Threshold 11-1 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Threshold 11-2 Expose sensitive receptors to substantial pollutant concentrations.

Threshold 11-3 Conflict with or obstruct implementation of applicable air quality plans of either the South Coast AQMD (SCAQMD) or the Antelope Valley AQMD (AVAQMD).

Threshold 11-4 Create objectionable odors affecting a substantial number of people.

Threshold 11-5 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The AVAQMD and the SCAQMD have established CEQA significance thresholds for use by lead agencies in air quality impact analysis as detailed below.

Antelope Valley Air Quality Management District Thresholds

The AVAQMD's CEQA and Federal Conformity Guidelines (2016) establishes significance thresholds to assess the regional impact of project-related air pollutant emissions in the AVAQMD. Table 5.11-6, Antelope Valley Air Quality Management District Criteria Pollutant Significance Thresholds, summarizes the AVAQMD's mass emissions thresholds, which are presented as both daily and annual values. The AVAQMD guidelines state that a project with "phases shorter than one year can be compared to the daily value" (AVAQMD 2016b). However, the Project, as analyzed, would not have construction or operational phases shorter than one year, and the AVAQMD daily thresholds are not used. A project with emission rates below these thresholds is considered to have a less than significant effect on regional air quality throughout the AVAQMD portion of the MDAB.

TABLE 5.11-6
ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT
CRITERIA POLLUTANT SIGNIFICANCE THRESHOLDS

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (lbs)
Greenhouse Gases (CO_2e)	100,000	548,000
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NOx)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SOx)	25	137
Particulate Matter (PM10)	15	82
Particulate Matter (PM2.5)	12	65
Hydrogen Sulfide (H_2S)	10	54
Lead	0.6	3
lbs: pounds; CO_2e: carbon dioxide equivalent, Source: AVAQMD 2016b.		

Toxic Air Contaminants

The AVAQMD's CEQA and Federal Conformity Guidelines establish the significant risk thresholds at 10 in 1 million for cancer risks and 1.0 for non-cancer chronic and acute HIs.

South Coast Air Quality Management District Thresholds

The SCAQMD has established significance thresholds to assess the regional and localized impacts of Project-related air pollutant emissions. The significance thresholds are updated as needed to appropriately represent the most current technical information and attainment status in the SoCAB. Table 5.11-7, South Coast Air Quality Management District Thresholds of Significance, presents the current significance thresholds. A project with daily emission rates, risk values, or concentrations below these thresholds is generally considered to have a less than significant effect on air quality.

TABLE 5.11-7
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
THRESHOLDS OF SIGNIFICANCE

Mass Daily Thresholds (lbs/day)		
Pollutant	**Construction**	**Operation**
VOC	75	55
NOx	100	55
CO	550	550
PM10	150	150
PM2.5	55	55
SOx	150	150
Lead	3	3
Toxic Air Contaminants		
TACs[a]	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 $MTCO_2e$/yr for industrial facilities	
Ambient Air Quality For Criteria Pollutants[b]		
NO_2	1-hour average ≥ 0.18 ppm Annual average ≥ 0.03 ppm	
CO	1-hour average ≥ 20.0 ppm (State) 8-hour average ≥ 9.0 ppm (State/federal)	
PM10	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation) Annual average ≥ 1.0 µg/m^3	
PM2.5	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation)	
Sulfate	24-hour average ≥ 1.0 µg/m^3	
Lead 30-day average Rolling 3-month average	1.5 µg/m^3 (state) 0.15 µg/m^3 (federal)	

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SOx: sulfur oxides; TACs: toxic air contaminants; SCAQMD: South Coast Air Quality Management District; GHG: greenhouse gas; $MTCO_2e$/yr: metric tons of carbon dioxide equivalent per year; NO_2: nitrogen dioxide; ppm: parts per million; µg/m^3: micrograms per cubic meter

[a] TACs (carcinogenic and noncarcinogenic)

[b] Ambient air quality threshold based on SCAQMD Rule 403.

Source: SCAQMD 2015

5.11.7 ENVIRONMENTAL IMPACTS

Threshold 11-1 Would the proposed project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

On-Site Impacts

Mass Daily and Annual Emissions Standards

Construction-Related Impacts

Temporary impacts would result from Project construction activities. Air pollutants would be emitted by construction equipment and fugitive dust generated during grading of the Project site. Other construction activities that emit pollutants include painting, surface coating, and asphalt paving operations. For this analysis, construction has been divided into four phases: grading, building, application of architectural coatings, and paving. Project emissions were calculated using CalEEMod version 2016.3.1 as described in the Methodology section.

Emissions are evaluated on annual rate (tons per year) in accordance with the AVAQMD criteria pollutant thresholds (Table 5.11-6) and on a daily rate (pounds per day) in accordance with SCAQMD thresholds of significance (Table 5.11-7).

Once construction begins (in Year 1), it will proceed continuously for approximately 20 years, with full buildout completed after 20 years. Construction emissions are calculated for the following construction activities: grading, building, paving, and architectural coating (painting).[4] The rate of construction would vary with a variety of factors including, but not limited to market demand, weather, and as-found site conditions. The estimation of the quantities of grading, building, paving, and painting on a year-by-year basis for a 20-year project would be highly speculative. Therefore, the construction effort is initially evaluated assuming that each construction activity would be spread equally over the applicable years. Additionally, as further explained below, construction emissions are evaluated for a peak grading year.

Average Year Assumptions. Grading would occur from Year 1 through Year 18. Preliminary grading engineering design indicates that approximately 127 million cubic yards (mcy) of earth would be moved for the total Project. Based on the preliminary grading estimates, the average daily grading quantity over the 18 years of grading would be approximately 26,500 to 36,500 cubic yards (cy), depending on the number of days of grading. For a conservative estimate, it is assumed that grading would be limited by weather and other factors to 200 days per year, and the average daily grading quantity would be 36,500 cy. Cut and fill would be balanced on the Project site and no off-site export or import is anticipated. Soil movement

4 Emissions modeling often includes demolition and site preparation (clearing and grubbing) activities. Demolition required for the proposed Project would be negligible. Clearing and grubbing would be predominantly grassland, and would occur concurrently with grading.

within the site would be by scraper. Equipment used for the average year grading analysis is shown in Table 5.11-8.

TABLE 5.11-8
GRADING, BUILDING, PAVING, AND ARCHITECTURAL COATING EQUIPMENT FOR AVERAGE YEAR EMISSIONS ESTIMATES

Equipment Type	Number of Equipment
Grading	
Scrapers	10
Dozers	7
Compactors	2
Water trucks	2
Graders	1
Building	
Cranes	4
Forklifts	12
Tractor/Loader/Backhoes	12
Welders	4
Generator Sets	4
Paving	
Paving Machine	1
Roller	3
Architectural Coating	
Compressors	4

The Project Applicant/Developer is required to implement dust-control measures as prescribed in AVAQMD Rule 403, Fugitive Dust, and SCAQMD Rule 403, Fugitive Dust. AVAQMD Rule 403 and SCAQMD Rule 403 require that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source.

Two options are presented in SCAQMD Rule 403: monitoring of particulate concentrations or active control. The exact method would be determined at the time of the preparation of the Dust Control Plan. Monitoring involves a sampling network around the Project site with no additional control measures unless specified concentrations are exceeded. The active control option does not require any monitoring, but requires that a list of measures be implemented starting with the first day of construction. Basic measures include pre-watering of grading sites, watering during grading, and watering or chemical treatment of stockpiles. Compliance with these rules will result in reducing short-term particulate pollutant emissions.

SCAQMD Rule 403 requires that "Large Operations" implement additional measures. A Large Operation is defined as "any active operations on a property that contain 50 or more acres

of disturbed surface area or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic meters (5,000 cubic yards) or more 3 times during the most recent 365 day period" (SCAQMD 1976b). Grading of the Project would be considered a Large Project under Rule 403. Therefore, the Project shall be required to implement the applicable actions specified in Table 2 of the Rule, which is included in EIR Appendix 5.11-D. As a Large Operation, the Project shall also be required to do the following:

- Submit a fully executed Large Operation Notification (SCAQMD Form 403N) to the SCAQMD Executive Officer within 7 days of qualifying as a large operation.
- Include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site.
- Maintain daily records to document the specific dust-control actions taken, maintain such records for a period of not less than three years, and make such records available to the Executive Officer upon request.
- Install and maintain Project signage with Project contact information that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earth-moving activities.
- Identify a Dust-Control Supervisor that is employed by or contracted with the Property Owner/Developer; is on the site or available on site within 30 minutes during working hours; has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements; and has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class.
- Notify the SCAQMD Executive Officer in writing within 30 days after the site no longer qualifies as a large operation.

Further, SCAQMD Rule 403 requires that that the Project not "allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation" (SCAQMD 1976b). All track-out from an active operation is required to be removed at the conclusion of each workday or evening shift. Any active operation with a disturbed surface area of 5 or more acres or with a daily import or export of 100 cubic yards or more of bulk materials must utilize at least one of the measures listed in Table 3 of SCAQMD Rule 403 at each vehicle egress from the site to a paved public road.

Rule 403 measures include regular watering of active grading areas and unpaved roads, limiting vehicle speeds on unpaved surfaces, stabilizing stockpiled earth, and curtailing grading operations during high wind conditions. Watering of active grading areas is included in the CalEEMod emissions analysis and results in reduced PM10 and PM2.5 emissions. It should be noted that some Project requirements and features, such as watering grading areas, although required Project elements, are shown in the CalEEMod format as mitigation measures.

Building would occur from Year 2 through Year 20. Similar to grading, the intensity of building would vary from a low of approximately 400 residential dwelling units (du) in Year 2 to approximately 1,200 du, which would occur in many years. Conservatively, for emission estimation, the average residential construction is assumed to be 1,018 dwelling units per year. The average non-residential construction is assumed to be 531,400 square feet per year. For purposes of emissions estimation, it is assumed that utilities installation and paving, occur concurrently with building; architectural coating would begin six months after the start of building and continue through buildout.

The Project Applicant/Developer is required to use architectural coatings compliant with AVAQMD Rule 1113 and SCAQMD Rule 1113, which limit the VOC content of architectural coatings. Based on these rules, it was assumed that the average VOC content of architectural coatings would not exceed 50 grams per liter (g/L) for all interior surfaces, 100 g/L for residential exterior surfaces, and 150 g/L for non-residential exterior surfaces. It was also assumed that 50 percent of the non-residential exterior surface would be painted. Equipment used for the building, paving, and architectural coating analysis is shown in Table 5.11-8.

Average Year Construction Emissions. Average year construction emissions are the total of Project emissions from the scenario described above that assumes concurrent grading, building construction, architectural coatings, and asphalt paving activities. Table 5.11-9 shows the estimated annual emissions for each year from Year 1 through Year 20 for the average construction year, and emissions are compared to the AVAQMD thresholds. Table 5.11-10 shows the estimated daily emissions for each year from Year 1 through Year 20 for the average construction year, and emissions are compared to the SCAQMD thresholds. CalEEMod input and output data for these emissions are included in Appendix 5.11-A to this EIR.

TABLE 5.11-9
AVERAGE YEAR ESTIMATED ANNUAL CONSTRUCTION EMISSIONS (AVAQMD THRESHOLDS)

Year	Emissions (tons/year)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Year 1	1	14	9	<1	9	5
Year 2	5	**56**	40	<1	12	7
Year 3	13	**63**	51	<1	12	6
Year 4	15	**58**	49	<1	12	6
Year 5	14	**53**	46	<1	11	6
Year 6	14	**48**	43	<1	11	6
Year 7	13	**43**	41	<1	11	5
Year 8	13	**39**	40	<1	11	5
Year 9	13	**37**	39	<1	10	5
Year 10	12	**32**	36	<1	10	5
Year 11	12	**32**	35	<1	10	5
Year 12	12	**31**	35	<1	10	5
Year 13	12	**31**	35	<1	10	5
Year 14	12	**31**	35	<1	10	5
Year 15	12	18	27	<1	9	4
Year 16	12	18	27	<1	9	4
Year 17	12	18	27	<1	9	4
Year 18	12	18	27	<1	9	4
Year 19	10	7	14	<1	2	1
Year 20	10	7	14	<1	2	1
Maximum	15	**63**	51	<1	12	7
AVAQMD Thresholds (Table 5.11-6)	***25***	***25***	***100***	***25***	***15***	***12***
Exceeds AVAQMD Thresholds?	**No**	**Yes**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; AVAQMD: Antelope Valley Air Quality Management District

Bold indicates emissions exceeding threshold

Source: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A

TABLE 5.11-10
AVERAGE YEAR ESTIMATED DAILY CONSTRUCTION EMISSIONS
(SCAQMD THRESHOLDS)

Year	Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Year 1	36	**423**	289	<1	72	41
Year 2	56	**543**	424	1	92	51
Year 3	**117**	**484**	400	1	91	49
Year 4	**113**	**445**	377	1	88	47
Year 5	**110**	**407**	355	1	86	45
Year 6	**106**	**368**	335	1	84	43
Year 7	**103**	**329**	320	1	82	41
Year 8	**101**	**300**	307	1	81	40
Year 9	**99**	**278**	297	1	80	39
Year 10	**96**	**241**	275	1	78	37
Year 11	**96**	**241**	273	1	78	37
Year 12	**96**	**241**	271	1	78	37
Year 13	**96**	**241**	269	1	78	37
Year 14	**95**	**240**	267	1	78	37
Year 15	**95**	**137**	211	1	73	33
Year 16	**95**	**137**	209	1	73	33
Year 17	**95**	**137**	208	1	73	33
Year 18	**95**	**137**	207	1	73	33
Year 19	**76**	57	110	<1	15	5
Year 20	**75**	52	108	<1	15	4
Maximum	**117**	**543**	424	1	92	51
SCAQMD Thresholds (Table 5.11-7)	***75***	***100***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**Yes**	**Yes**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CalEEMod: California Emissions Estimator Model

Bold indicates emissions exceeding threshold

Source: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A.

As shown in Table 5.11-9, using average year assumptions, estimated construction NOx emissions would exceed the AVAQMD annual emissions thresholds from Year 2 through Year 14. The primary source of NOx emissions would be the exhaust emissions from diesel-engine equipment used for site grading. Beginning in Year 15, the estimated NOx emissions are less than the AVAQMD thresholds and substantially less than in previous years not because of any change in Project activity, but because of a change in the emission factors in the

CalEEMod database. The emission factors assume continuing reductions in NOx emissions due to increasing use of newer equipment with cleaner engines (Tier 3, Tier 4 Interim, Tier 4 Final) as required by USEPA regulations. The change is substantial in Year 15 because, prior to Year 10, the model has emission factors for each year and after 2025 the emission factors are in five-year increments. Estimated emissions of VOC, CO, SOx, PM10, and PM2.5 would be less than the AVAQMD thresholds. The NOx emissions impact would be potentially significant.

As shown in Table 5.11-10, using average year assumptions, estimated construction NOx emissions would exceed the SCAQMD daily emissions thresholds from Year 1 through Year 18, the entire grading period. VOC emissions would exceed the daily emissions thresholds from Year 3 through Year 18, which are the years when grading, building, paving, and painting are concurrent activities. The primary sources of VOC emissions would be architectural coatings and exhaust emissions from grading equipment. Estimated emissions of CO, SOx, PM10, and PM2.5 would be less than the SCAQMD thresholds. The VOC and NOx emissions impacts would be potentially significant.

Peak Grading Year Assumptions. Construction emissions, particularly NOx emissions, are dominated by the magnitude of grading effort and the emissions of scrapers, dozers, and similar equipment. Preliminary grading engineering design indicates that the peak year for grading would he approximately Year 11 and the grading quantity could be approximately 17 mcy, or an average of 86,000 cy/day. Equipment used for the average year grading analysis is shown in Table 5.11-11.

TABLE 5.11-11
GRADING EQUIPMENT FOR PEAK GRADING YEAR

Equipment type	Number of Equipment
Scrapers	26
Dozers	18
Compactors	5
Water trucks	6
Graders	2

Peak Grading Year Construction Emissions. To evaluate the peak grading year scenario, calculations were made using the equipment required for the peak grading year in Table 5.11-11 combined with the average year equipment for building, painting, and paving activities (Table 5.11-8).

The results are in Tables 5.11-12 and 5.11-13, which show annual and daily emissions, respectively.

TABLE 5.11-12
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR THE PEAK GRADING YEAR (ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS)

Year	Emissions (tons/year)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Year 11	16	**64**	64	<1	**22**	11
AVAQMD Thresholds (Table 5.11-6)	***25***	***25***	***100***	***25***	***15***	***12***
Exceeds AVAQMD Thresholds?	**No**	**Yes**	**No**	**No**	**Yes**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; AVAQMD: Antelope Valley Air Quality Management District

Bold indicates emissions exceeding threshold

Source: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A.

TABLE 5.11-13
ESTIMATED DAILY CONSTRUCTION EMISSIONS FOR THE PEAK GRADING YEAR (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS)

Year	Emissions (lbs/day)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Year 11	**123**	**490**	494	1	**172**	**85**
SCAQMD Thresholds (Table 5.11-7)	***75***	***100***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**Yes**	**Yes**	**No**	**No**	**Yes**	**Yes**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CalEEMod: California Emissions Estimator Model

Bold indicates emissions exceeding threshold

Sources: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A.

Estimated emissions for the peak grading year would be substantially greater than for an average year. Peak grading year annual emissions of VOC, CO, SOx, and PM2.5 would remain below AVAQMD thresholds; there would be potential significant impacts for annual NOx, and PM10 emissions. Peak grading year daily emissions of CO and SOx would remain below SCAQMD thresholds. There would be potential significant impacts for daily VOC, NOx, PM10, and PM2.5 emissions.

To reduce NOx and VOC emissions without reducing the quantity or operating hours of construction equipment, which would extend the duration of grading, equipment with newer, low-emissions engines should be used. MM 11-2 requires the use of construction

equipment with Tier 4 Final diesel engines and on-road trucks with 2010 or newer engines to the extent that the equipment is available.

Project emissions that could occur with the use of Tier 4 Final construction equipment, as required by MM 11-2, are shown in Table 5.11-14 and Table 5.11-15 for the average construction year and in Table 5.11-16 and Table 5.11-17 for the peak grading year.

TABLE 5.11-14
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS WITH IMPLEMENTATION OF MITIGATION (TIER 4 FINAL EQUIPMENT, IF AVAILABLE) FOR THE AVERAGE YEAR (AVAQMD THRESHOLDS)

	Emissions (tons/year)					
Year	**VOC**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Year 1	<1	1	5	<1	9	5
Year 2	1	4	26	<1	12	7
Year 3	8	8	41	<1	12	6
Year 4	10	8	40	<1	12	6
Year 5	10	7	40	<1	11	6
Year 6	10	7	39	<1	11	6
Year 7	10	7	38	<1	11	5
Year 8	10	6	38	<1	11	5
Year 9	10	6	38	<1	10	5
Year 10	10	6	37	<1	10	5
Year 11	10	6	37	<1	10	5
Year 12	10	6	37	<1	10	5
Year 13	10	6	36	<1	10	5
Year 14	10	6	36	<1	10	5
Year 15	10	6	36	<1	9	4
Year 16	10	6	36	<1	9	4
Year 17	10	6	36	<1	9	4
Year 18	10	6	35	<1	9	4
Year 19	9	3	15	<1	2	1
Year 20	9	3	14	<1	2	1
Maximum	10	8	41	<1	12	7
AVAQMD Thresholds (Table 5.11-6)	***25***	***25***	***100***	***25***	***15***	***12***
Exceeds AVAQMD Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; AVAQMD: Antelope Valley Air Quality Management District

Sources: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A.

TABLE 5.11-15
ESTIMATED DAILY CONSTRUCTION EMISSIONS
WITH IMPLEMENTATION OF MITIGATION (TIER 4 FINAL EQUIPMENT, IF AVAILABLE) FOR THE AVERAGE YEAR (SCAQMD THRESHOLDS)

Year	Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Year 1	5	18	160	<1	22	10
Year 2	16	62	308	1	35	15
Year 3	**82**	61	316	1	37	15
Year 4	**81**	59	308	1	37	15
Year 5	**80**	56	303	1	37	15
Year 6	**79**	54	298	1	37	15
Year 7	**79**	52	294	1	37	15
Year 8	**78**	47	290	1	37	15
Year 9	**78**	47	287	1	37	15
Year 10	**78**	46	284	1	37	15
Year 11	**77**	46	282	1	37	15
Year 12	**77**	45	280	1	37	15
Year 13	**77**	45	278	1	37	15
Year 14	**77**	45	277	1	37	15
Year 15	**76**	44	275	1	37	14
Year 16	**76**	44	273	1	37	14
Year 17	**76**	43	272	1	37	14
Year 18	**76**	43	271	1	37	14
Year 19	71	25	112	<1	15	4
Year 20	71	25	111	<1	15	4
Maximum	**82**	62	316	1	37	15
SCAQMD Thresholds (Table 5.11-7)	***75***	***100***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**Yes**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District, CalEEMod: California Emissions Estimator Model

Bold indicates emissions exceeding threshold

Sources: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A.

TABLE 5.11-16
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS WITH IMPLEMENTATION OF MITIGATION (TIER 4 FINAL EQUIPMENT, IF AVAILABLE) FOR THE PEAK GRADING YEAR (AVAQMD THRESHOLDS)

Year	Emissions (tons/year)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Year 11	11	9	66	<1	9	4
AVAQMD Thresholds (Table 5.11-6)	***25***	***25***	***100***	***25***	***15***	***12***
Exceeds AVAQMD Thresholds?	**No**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; AVAQMD: Antelope Valley Air Quality Management District

Sources: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A.

TABLE 5.11-17
ESTIMATED DAILY CONSTRUCTION EMISSIONS WITH IMPLEMENTATION OF MITIGATION (TIER 4 FINAL EQUIPMENT, IF AVAILABLE) FOR THE PEAK GRADING YEAR (SCAQMD THRESHOLDS)

Year	Emissions (lbs/day)					
	VOC	NOx	CO	SOx	PM10	PM2.5
Year 11	**83**	**72**	**506**	**1**	**70**	**30**
SCAQMD Thresholds (Table 5.11-7)	***75***	***100***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**Yes**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CalEEMod: California Emissions Estimator Model

Bold indicates emissions exceeding threshold

Sources: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A.

As shown in Table 5.11-14 and Table 5.11-16, the use of all Tier 4 Final construction equipment would reduce annual NOx emissions for both average grading years and the peak grading year to less than the AVAQMD significance thresholds.

As shown in Table 5.11-15 and Table 5.11-17, the use of all Tier 4 Final construction equipment would reduce daily NOx emissions to less than the SCAQMD significance threshold for both the average grading years and the peak grading year. VOC emissions reductions resulting from the use of Tier 4 Final equipment would exceed the SCAQMD thresholds for both the average and peak grading years.

In summary, construction emissions of VOC would be significant and would be unavoidable because (1) it cannot be known if Tier 4 Final construction equipment could be feasibly and reasonably provided for enough construction equipment to result in emissions less than AVAQMD thresholds for all years and (2) even if Tier 4 Final construction equipment would be available, the SCAQMD daily VOC emissions threshold may be exceeded in some average years.

Operational Impacts – Buildout

Long-term operational criteria pollutant emissions are generated by area, energy, and mobile sources. Project regional area, energy, and mobile source emissions were calculated using CalEEMod, as described in the Methodology section above.

As previously described, but repeated here for continuity, area sources include landscape maintenance equipment, consumer products, and architectural coatings used for routine maintenance. Energy emissions are from natural gas consumption. The operational buildout analysis assumes the Project would include 13,954 single-family residences, 5,379 multi-family residences, 7.4 million square feet (sf) of business park uses, 1 million sf of commercial uses, 1.6 million sf of institutional/civic uses, elementary schools for 8,000 students, a high school for 3,500 students, and other land uses as described in Chapter 4.0, Project Description and the Project Traffic Study (Stantec 2016). Buildout is assumed to be complete in 2035. Land use details are included in the CalEEMod data included in Appendix 5.11-A.

The default natural gas use and resulting emissions calculations are modified by application of the 2016 State Energy Efficiency Standards for Residential and Nonresidential Buildings. As stated in PDF 11-2 which, through MM 21-2 of Section 5.21, Climate Change, is required to be implemented, the Green Development Program requires compliance with CALGreen voluntary measure A5.203.1.2.1 for non-residential buildings. As stated by PDF 11-3 and required by MM 21-3 of Section 5.21, Climate Change, the Project must comply with CALGreen voluntary Tier 1 measures to exceed the 2016 code for residential buildings. The combined effect is a 32.4 percent reduction from the CalEEMod base data for Title 24 natural gas uses.

Fireplace emissions are calculated in accordance with PDF 11-4, which is required by the implementation of MM 11-3, which assumes a maximum of 13,954 natural gas fireplaces and no wood-burning fireplaces.

Mobile source emissions are based on trip generation data from the Traffic Study. CalEEMod has input options to generate trip and vehicle miles traveled (VMT) reductions for mixed-use projects, increased density, neighborhood walkability, and similar features. For the Project, features related to the mixed-use character of the Project that would reduce trips and VMT have been included in the Traffic Study. The Traffic Study also includes regional traffic modeling results that indicate that implementation of the Project would result in an estimated 1,921,599 VMT weekday increase over existing conditions. The CalEEMod trip distances were modified to yield a VMT increase consistent with the Traffic Study. As described in Section 5.11.3, trip generation for affordable housing is less than for market rate

housing. This trip generation and corresponding emissions reduction is not included in the traffic analysis and is made manually due to defects in this element of CalEEMod (SCAQMD 2016b).

Estimated annual and maximum daily operational emissions at buildout are shown in Tables 5.11-18 and 5.11-19.

TABLE 5.11-18
ESTIMATED ANNUAL OPERATIONAL EMISSIONS
(AVAQMD THRESHOLDS)

Source	Emissions (tons/year)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Area Sources	**225**	11	**147**	<1	2	2
Energy Sources	3	23	11	<1	2	2
Mobile Sources	**25**	**71**	**387**	2	**235**	**63**
Total Operational Emissions*	**253**	**105**	**545**	2	**238**	**67**
AVAQMD Thresholds(Table 5.11-6)	***25***	***25***	***100***	***25***	***15***	***12***
Exceeds AVAQMD Thresholds?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; AVAQMD: Antelope Valley Air Quality Management District.

* Totals may not add due to rounding.

Bold indicates emissions exceeding threshold Sources: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A

TABLE 5.11-19
ESTIMATED MAXIMUM DAILY OPERATIONAL EMISSIONS
(SCAQMD THRESHOLDS)

Source	Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Winter Season						
Area Sources	**1,278**	**250**	**1,690**	2	28	28
Energy Sources	14	**124**	61	1	10	10
Mobile Sources	**168**	**489**	**2,461**	11	**1,551**	**417**
*Total Winter Season Operational Emissions**	**1,461**	**863**	**4,212**	14	**1,589**	**455**
Summer Season						
Area Sources	**1,278**	**250**	**1,690**	2	28	28
Energy Sources	14	**124**	61	1	10	10
Mobile Sources	**173**	**472**	**2,636**	12	**1,551**	**417**
*Total Summer Season Operational Emissions**	**1,465**	**846**	**4,387**	14	**1,589**	**455**
Higher of Winter or Summer	**1,465**	**863**	**4,387**	14	**1,589**	**455**
SCAQMD Thresholds(Table 5.11-7)	***55***	***55***	***550***	***150***	***150***	***55***
Exceeds SCAQMD Thresholds?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

lbs/day: pounds per day, VOC: volatile organic compounds, NOx: nitrogen oxides, CO: carbon monoxide, SOx: sulfur oxides, PM10: respirable particulate matter with a diameter of 10 microns or less, PM2.5: fine particulate matter with a diameter of 2.5 microns or less, SCAQMD: South Coast Air Quality Management District.

* Totals may not add due to rounding.

Bold indicates emissions exceeding threshold

Sources: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A.

As shown in Table 5.11-18 and Table 5.11-19, the estimated operational emissions would substantially exceed both the AVAQMD annual emissions thresholds and the SCAQMD daily emissions thresholds for VOC, NOx, CO, PM10, and PM2.5. The SOx thresholds would not be exceeded. Vehicle emissions would be the dominant source of NOx, CO, PM10, and PM2.5 emissions and a secondary source of VOC emissions. The dominant source of VOC emissions would be consumer products at 200 tons per year (tons/year) and 1,096 pounds per day (lbs/day). Operational emissions would be a significant impact.

As noted above, the primary area emissions sources are consumer products and landscape maintenance equipment. There are no feasible mitigation measures for consumer product VOC emission reductions. However, it should be noted that State consumer products regulations were updated in January 2015, requiring reduced VOC emissions. Therefore, the CalEEMod forecasts of consumer products VOC emissions may be assumed to be higher than would occur. With respect to landscape equipment, MM 11-5 would be incorporated into the Project, requiring that all multi-family residential buildings and all non-residential buildings

with adjacent landscaping be provided with exterior electrical receptacles to encourage the use of electric landscaping equipment instead of gasoline powered equipment.

As required by MM 10-1 from Section 5.10, Traffic, Access, and Circulation, the mixed-use character of the Project, the jobs-housing balance, and the Mobility Plan with Transportation Demand Management (TDM) features would provide a very transportation-efficient Project with an estimated 48 percent of the trip generation being short-distance internal trips. As part of the TDM strategy to reduce the dependence on the private automobile, the Project Applicant/Developer will create and operate an ongoing Transportation Management Association (TMA) to serve the residents and employees of businesses in the Project area or will be organized in conjunction with an existing organization in the Antelope Valley or Santa Clarita area. As further discussed in Section 5.10, it is anticipated that a total of 200 per weekday vehicle trips to and from the Santa Clarita Valley and 110 per weekday trips to and from the Antelope Valley would be reduced by commuter buses and rideshare programs.

However, in an effort to further reduce mobile emissions by encouraging alternative transportation modes, reducing single-occupant commuting, and electric-powered vehicles, MM 11-4, MM 11-5 and MM 11-6 would be incorporated into the Project. These three MMs require preferential parking for alternative-fueled vehicles and electric vehicle charging facilities for non-residential buildings, residential buildings, parking garages, and parking lots. MM 11-4 also requires preferential parking for carpool vehicles and charging facilities for some non-residential buildings. MM 11-5 and MM 11-6 also require bicycle parking for residential buildings and parking facilities.

The reductions that would result from implementation of MM 11-4 through MM 11-6 are not reasonably quantified. However, the reductions would not be of a magnitude to reduce the operational emissions to a less than significant level.

Combined Construction and Operational Emissions during Development

During Project development, the initial phases of the Project would be occupied while construction continues on future phases. In accordance with recent SCAQMD recommendations, a calculation of combined construction and operational emissions is provided for information. As a reasonable worst-case scenario, it is assumed that the Project would be 90 percent operational in Year 18 and consequently 90 percent of operational phase emissions were combined with construction emissions occurring in Year 18. The estimated Year 18 combined annual and daily emissions are shown in Table 5.11-20 and Table 5.11-21, respectively.

TABLE 5.11-20
ESTIMATED ANNUAL COMBINED EMISSIONS
(AVAQMD THRESHOLDS)

Source	Emissions (tons/year)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Unmitigated Emissions						
Year 18 Construction	12	18	27	<1	9	4
Year 18 Operations	**228**	**95**	**491**	2	**214**	**60**
Combined Year 18 Emissions	**240**	**113**	**518**	2	**223**	**64**
AVAQMD Operations Thresholds	**25**	**25**	**100**	**25**	**15**	**12**
Exceeds Thresholds	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
Mitigated Emissions						
Year 18 Construction –Tier 4 Final equipment	10	6	35	<1	9	4
Year 18 Operations	**228**	**95**	**491**	2	**214**	**60**
Combined Year 18 Emissions – construction w/Tier 4 Final equipment	**238**	**101**	**526**	2	**223**	**64**
AVAQMD Operations Thresholds	**25**	**25**	**100**	**25**	**15**	**12**
Exceeds Thresholds	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Note: Totals may not add due to rounding.

Bold indicates emissions exceeding threshold

Sources: AVAQMD 2016b (thresholds). Emissions calculations can be found in Appendix 5.11-A

TABLE 5.11-21
ESTIMATED ANNUAL MID-PROJECT COMBINED EMISSIONS
(SCAQMD UNITS [LBS/DAY])

Source	Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Unmitigated Emissions						
Year 18 Construction	**94**	**137**	207	1	73	33
Year 18 Operations	**1,319**	**761**	**3,948**	13	**1,430**	**410**
Combined Year 11 Emissions	**1413**	**898**	**4155**	2	**1503**	**443**
SCAQMD Operations Thresholds	55	55	550	150	150	55
Exceeds Threshold	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**
Mitigated Emissions						
Year 11 Construction	**75**	43	272	1	37	14
Year 11 Operations	**1,319**	**761**	**3,948**	13	**1,430**	**410**
Combined Year 11 Emissions – construction	**1,394**	**804**	**4,220**	2	**1,467**	**424**
SCAQMD Operations Thresholds	55	55	550	150	150	55
Exceeds Threshold	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**

lbs/day: pounds per day; VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

Note: Totals may not add due to rounding.

Bold indicates emissions exceeding threshold

Sources: SCAQMD 2015 (thresholds). Emissions calculations can be found in Appendix 5.11-A

As shown in Table 5.11-20, Year 18 combined construction and operations annual emissions would exceed the operational emissions thresholds established by the AVAQMD. As shown in Table 5.11-21, Year 18 combined construction and operations daily emissions would exceed the SCAQMD significance thresholds for the operations phase. The exceedance of the significance thresholds for both of the air districts are due to the larger proportion of emissions generated during the operations phase. The finding of significant impacts for the combined construction and operations phases are consistent with the finding of significant impacts for emissions occurring for solely for the operations phase of the Project.

Stationary Sources

An Air Quality Impact Analysis (AQIA) was prepared by ENVIRON International (now Ramboll Environ) in 2009 to assess the impacts of stationary sources of emissions that would be allowed and could locate on the Project site. Each substantial stationary source would be required to obtain a Permit to Construct and a Permit to Operate in accordance

with AVAQMD Regulation II, Permits, and included in Rules 201 through 226 or SCAQMD Regulation II, Permits, and included Rules 201 through 223. Based on the results of the AQIA, the stationary source size limits included in PDF 11-1 (Table 5.11-5) were established. The analysis of individual sources is described in Appendix 5.11-B. In addition to assessing individual sources, the aggregate total emissions from these anticipated sources were calculated, and are shown in Table 5.11-22, Aggregate Emissions from Stationary Sources. Natural gas fired boilers used for general purpose heating in facilities like schools, hospitals, commercial buildings, and light industrial uses account for all the estimated stationary source CO emissions, 99.4 percent of the NOx emissions, and 76 percent of the PM10 emissions. The other sources of PM10 emissions with more than ten percent of the total are charbroilers used in restaurants. The principal single stationary source type contributor of VOC emissions is spray booths, which account for approximately 36 percent of the emissions. The remaining VOC emissions would be generated by smaller sources including gas stations, boilers, dry cleaners, and light industrial processes. Stationary sources would be operated according to permits issued by AVAQMD or SCAQMD, and the District's permitting process for stationary sources requires offsetting emissions and compliance with emission reduction mandates for criteria pollutants to attain regional ambient air quality goals.

TABLE 5.11-22
AGGREGATE EMISSIONS FROM STATIONARY SOURCES

Emissions Source	Pollutant Emissions			
	VOC	NO_X	CO	PM10
Annual Emissions (tons/year)				
Natural Gas-Fired Boilers	16.5	33.7	920.0	22.8
Emergency Generators	0.0	0.2	0.3	0.0
Dry Cleaners	8.2	0.0	0.0	0.0
Spray Booths	80.0	0.0	0.0	0.0
Service Stations	25.5	0.0	0.0	0.0
Non-Gasoline Underground Storage Tanks	14.5	0.0	0.0	0.0
Other VOC Emitters	80.0	0.0	0.0	0.0
Small PM10 Sources	0.0	0.0	0.0	4.2
Charbroilers	0.8	0.0	0.0	3.2
Total Aggregate Emissions	*225.5*	*33.9*	*920.3*	*30.2*
Daily Emissions (lbs/day)				
Total Aggregate Emissions	*1,235.6*	*185.8*	*5,042.7*	*165.4*

VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter with a diameter of 10 microns or less

Source: ENVIRON 2009a (Appendix 5.11-B).

Impact Summary*: *Mass Daily and Annual Thresholds. Based on the AVAQMD annual thresholds and SCAQMD mass daily thresholds, construction-related emissions of VOC and NOx would result in significant impacts. MM 11-1 and MM 11-2 would be implemented to reduce emissions; however, the impacts would remain significant and unavoidable and full implementation of MM 11-2 would result in a significant and unavoidable CO impact for the SCAQMD threshold. Long-term operational emissions of CO, VOCs, NOx, PM10, and PM2.5 would result in significant impacts. MM 11-3 would be implemented to reduce emissions; however, the impacts would remain significant and unavoidable.

Ambient Air Quality Standards

Construction-Related Impacts

As described in the Methodology section above, ENVIRON used ISCST3 (Version 02035) with the USEPA's default model settings to model the transport of NOx (which is converted to NO_2), PM10, and PM2.5 emissions to sensitive receptors. The impacts were evaluated and compared to the CAAQS, NAAQS, and SCAQMD Localized Significance Thresholds (LSTs) (see EIR Appendix 5.11-C).

It is assumed that construction of each phase would occur sequentially so that construction phases will not overlap and residents of occupied phases would not be exposed to emissions from more than one adjacent phase. In the ENVIRON analysis, the previous project was evaluated in four phases. Ambient air concentrations resulting from Phase Two construction emissions were evaluated at the boundary of Phase One. Emissions from Phase Three construction were evaluated at the boundaries of Phases One and Two, and emissions from Phase Four construction were evaluated at the boundaries of Phases One, Two, and Three. Additionally, a grid of receptors with 500-meter (1,640-feet) spacing was placed over the entire site.[5] Although the phasing for the Project differs from the phasing for the previous project, the concept of air quality impacts from a phase under construction to an occupied phase is the same. The input emissions data for the ambient air quality standard analysis is based on the construction emissions data. The NOx emissions data for the previous project and the currently proposed Project are generally the same. The PM10 and PM2.5 emissions for the Project are substantially less than for the previous project, thus making the PM10 and PM2.5 results very conservative[6]. The results are provided below in Table 5.11-23, Ambient Concentrations at Sensitive Receptors during Phase Two, Three, and Four Construction.

TABLE 5.11-23
AMBIENT CONCENTRATIONS AT SENSITIVE RECEPTORS DURING PHASE TWO, THREE, AND FOUR CONSTRUCTION

Regulated Pollutant	Averaging Time	Federal Standard (µg/m³)	State Standard (µg/m³)	LST Background Concentration (µg/m³)	LST Threshold Concentration (µg/m³)	Maximum Estimated Concentration at Nearest Sensitive Receptor (µg/m³)*		
						Phase Two	Phase Three	Phase Four
NO_2	AAM	100	56	–	56.0	0.5	0.8	0.8
	1hour	–	338	188	150.0	36	38	60
PM10	AAM	–	20	–	20.0	5.8	11.2	7.0
	24hour	150	50	–	10.4	**90**	**159**	**136**
PM2.5	AAM	15	12	–	12.0	1.3	2.5	1.5
	24hour	35	–	–	10.4	**19**	**34**	**29**

LST: Localized Significance Threshold; µg/m³: micrograms per cubic meter; NO2: nitrogen dioxide; AAM : annual arithmetic mean; – : no standard or LST value; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less

* Values in excess of State, federal or SCAQMD standards are displayed in **bold text** in these columns.

Source: ENVIRON 2009b (Appendix 5.11 C)

5 The construction phases and sensitive receptor locations are shown in Figure 2-1 of EIR Appendix 5.11-B.

6 PM emissions for the previous project were calculated using the then-current Urbemis emissions model. Studies conducted for the now-current CalEEMod emissions model resulted in a revised methodology for PM emissions and substantially reduced emissions compared to Urbemis results. With respect to NOx emissions, although unmitigated emissions from the current project and the previous project are similar, the implementation of MM 11-2 would reduce Project NOx emissions substantially compared to the emissions used in the ENVIRON local impacts analysis.

As identified in Table 5.11-23 above, estimated NO_2 concentrations would be less than State, federal, and SCAQMD LST standards, but ambient concentrations at sensitive receptor locations may exceed the 24-hour standards for PM10 and PM2.5 during construction. It is noted that, if construction activities were localized to one or several planning areas within a construction phase that are near already-established sensitive receptors, the resultant concentrations could be higher. This would be a significant and unavoidable impact. AVAQMD Rule 403 requires a dust control plan to be prepared for any residential developments that result in a disturbed surface area of 10 acres or more or 5 acres or more for non-residential development. As such, the Project Applicant/Developer shall prepare a Supplementary Dust Control Plan for approval by the County to minimize PM10 and PM2.5 emissions and the transport of those emissions towards sensitive receptors. Measures in the Supplementary Dust Control Plan may include, but not be limited to additional watering of active grading areas and disturbed areas; stopping operations when winds exceeding ten miles per hour are in the direction from the grading towards the receptors; and/or other measures to minimize fugitive dust. With incorporation of Rule 403, impacts would remain significant and unavoidable because the dust suppression resulting from the Supplementary Dust Control Plan cannot be quantified at this time.

***Impact Summary*: *Ambient Air Quality Standards – Construction*.** Construction emissions could cause a potential temporary exceedance of federal, State, and SCAQMD PM10 and PM2.5 standards at Project residences that would be completed and occupied; with consideration of AVAQMD and SCAQMD dust control rules, this would be a significant and unavoidable impact.

Operations

The stationary sources analyzed above for mass emissions are limited by size and quantity as described in MM 11-1. The limitations are based on compliance with ambient air quality standards. In addition to the stationary sources, operational mobile and area sources would be dispersed throughout the Project area and would make contributions to local ambient pollutant concentrations. The ENVIRON AQIA for stationary sources, described above, includes an assumed background concentration that would account for the effects of mobile and area sources.

Of the eight stationary source types that are analyzed in the ENVIRON Report, only the natural gas fired boilers, restaurant broilers, emergency generators, and small source particular matter generators have the potential to impact ambient air quality standards. Boilers and emergency generators emit NOx, CO, PM10, and PM2.5, all of which have short-term ambient air quality limits. Broilers only emit particulates and VOCs. All other sources, including the wastewater reclamation facilities (WRFs), emit only VOCs, for which there are no State or federal ambient air quality standards. While NOx and PM10 also have annual limits, the short-term limits drive the ambient air quality standards' compliance, as demonstrated when applying USEPA factors for scaling concentrations over different averaging times. The AQIA accounts for the possibility of concurrent impacts at a receptor from more than one source by limiting the impact to one-quarter of the allowable increase in the ambient concentration. Additional details are in Appendix 5.11-B.

The stationary source limits of MM 11-1, which requires the implementation of PDF 11-1 and Table 5.11-5, are based on compliance with ambient air quality standards with conservative margins. Therefore, emissions from operational on-site sources would not exceed ambient air quality standards. The impact would be less than significant; no mitigation is required.

***Impact Summary*: *Ambient Air Quality Standards – Stationary Sources*.** The Project would involve the use of stationary sources (natural gas-fired boilers, emergency generators, broilers, and small source particulate matter generators) that emit NOx, CO, and PM10. Analysis of potential impacts concludes that this impact would be less than significant with the limitations on stationary sources included MM 11-1.

Mobile Sources – Carbon Monoxide Hotspots

The ambient air quality standard for CO is analyzed when there is a potential for severe traffic congestion at high-volume, signalized intersections. Localized areas where ambient concentrations exceed federal and/or State standards for CO are termed CO "hotspots". According to the *Transportation Project-Level Carbon Monoxide Protocol* (the Protocol), projects may worsen air quality if they worsen traffic flow, defined for signalized intersections as increasing average delay at intersections operating at Level of Service (LOS) E or F or causing an intersection that would operate at LOS D or better without the Project, to operate at LOS E or F with the Project (UCD ITS 1997).

The Project Traffic Study lists two signalized intersections that would operate at LOS E or F with conditions that would worsen in the 2035 With Project Scenario when compared to the 2035 No Project Scenario (Stantec 2016):

- I-5 Southbound Ramps and SR-126 in the PM peak hour
- I-5 Southbound Ramps and Valencia Boulevard in the AM and PM peak hours

The SCAQMD's analysis prepared for CO attainment in the SoCAB can be used to evaluate the potential for CO exceedances. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan) (SCAQMD 2003a). As discussed in the 1992 CO Plan, peak CO concentrations in the SoCAB are due to unusual meteorological and topographical conditions, and not due to the impact of particular intersections. Considering the region's unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of 1992 CO Plan and subsequent plan updates and AQMPs. In the 1992 CO Plan, a CO hot spot analysis was conducted for four busy intersections in the SoCAB at the peak morning and afternoon time periods.

The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood); Wilshire Boulevard and Veteran Avenue (Westwood); Sunset Boulevard and Highland Avenue (Hollywood); and La Cienega Boulevard and Century Boulevard (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated in the 1992 CO Plan and subsequent 2003 AQMP was at Wilshire

Boulevard and Veteran Avenue, which had a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 parts per million (ppm), which indicates that the most stringent 1-hour CO standard (20.0 ppm) would likely not be exceeded until the daily traffic at the intersection exceeded more than 400,000 vehicles per day. The maximum modeled 8-hour concentrations at this intersection were 5.8 ppm in 1997, decreasing to 2.8 ppm in 2005, compared with the 8-hour standard of 9 ppm. The Los Angeles County Metropolitan Transportation Authority evaluated the LOS in the vicinity of the Wilshire Boulevard/Veteran Avenue intersection and found it to be LOS E at peak morning traffic and LOS F at peak afternoon traffic.

Based on the data in the Project's Traffic Study, under 2035 With Project conditions, the average daily trips at the I-5 Southbound Ramps and SR-126 intersection is estimated at approximately 64,700 average daily trips (ADT) and the volume at the I-5 Southbound Ramps and Valencia intersection is estimated at approximately 61,700 ADT. These volumes are substantially below the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. There is no reason unique to the local meteorology or topography to conclude that the CO concentrations at these intersections would exceed the 1-hour CO standard if modeled in detail, as based on the studies undertaken for the 2003 AQMP. Moreover, vehicle standards have become increasingly more stringent since 1992 and background CO concentrations are less than in 1992; thus, this analysis is very conservative.

Therefore, the Project would not result in the creation of a CO hot spot and the impacts would be less than significant.

***Impact Summary*: Ambient Air Quality Standards –Mobile Sources – CO Hotspots.** The Project would not contribute to traffic conditions that would cause a CO hotspot. The impact would be less than significant.

Off-Site Impacts

Construction

Construction of the off-site Project features described in Section 4.7 of the EIR (i.e., roadway improvements, water infrastructure, and utilities connections) would generate short-term mass emissions. These construction activities and their associated emissions would be a small part of the estimated on-site emissions, quantified above in Table 5.11-10 through Table 5.11-17. MM 11-2 would be applicable to off-site construction activities. Separately, these emissions would not exceed applicable standards. However, these activities would occur concurrently with on-site construction and would add a small increment to calculated annual and peak-day significant and unavoidable construction emissions impacts.

Operational Impacts

Upon completion of construction, the Project's off-site roadway, water infrastructure, and utility improvements would not generate criteria air pollutants. There would be no impact.

Impact Summary: Off-Site Impacts. Off-site construction would add to concurrent on-site significant and unavoidable impacts. There would be no operational impact from off-site features.

Threshold 11-2 Would the proposed project expose sensitive receptors to substantial pollutant concentrations?

As previously described, sensitive receptors include, but are not limited to, residences, schools, school yards, day care facilities, hospitals, rest homes, long-term medical facilities, and parks/playgrounds. The nearest existing sensitive receptors to the Project site are residential properties near the Project site boundaries on 300th Street West, 290th Street West, and Malinda Avenue. Additional nearby residences include one located offsite on the south side of SR-138 west of the Cement Plant Road and homes between the Quail Lake Sky Park runway and SR-138. The residences, schools, and parks to be built as part of the Project would be sensitive receptors.

The following impact categories are addressed: construction emissions; valley fever; criteria pollutant emissions from on-site stationary sources; CO Hotspots; toxic air contaminants from on-site stationary sources; toxic air contaminants from existing off-site sources; and diesel particulate matter exposure from vehicles on SR-138.

On-Site Impacts

Construction Emissions

The impacts of construction emissions of criteria pollutants to sensitive receptors are analyzed above under Threshold 11-1, Ambient Air Quality Standards – Construction. The analysis indicates that Project construction activities occurring subsequent to the completion and occupation of earlier Project phases could result in exceedance of federal, State, or SCAQMD LST ambient air quality standards for 24-hour concentrations of PM10 and PM2.5 at on-site receptors. Therefore, these receptors could be temporarily exposed to substantial concentrations of PM10 or PM2.5 during the later phases of construction. This would be a significant impact. Dust-control measures and Tier 4 Final construction equipment (MM 11-2) would reduce PM10 and PM2.5 emissions but it cannot be demonstrated that the reductions would reduce concentrations to less than the applicable standards. The short-term impact would be significant and unavoidable.

Diesel PM, a TAC, would be emitted during construction due to the operation of heavy equipment at the site. Because diesel PM is considered a carcinogen, long-term exposure to diesel exhaust emissions have the potential to result in adverse health impacts. Neither the AVAQMD nor the SCAQMD has adopted procedures for quantitative analysis of short-term construction-related TAC exposure. Although construction of the Project would occur over a period of many years, use of diesel-powered construction equipment in any single area

would likely occur for no more than a few months and would cease when construction is completed in that area. Further, there will be limited periods when construction would be near adjacent residences.

The dose to which the receptors are exposed is the primary factor used to determine health risk.[7] Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual (MEI). The risks estimated for an MEI are higher if a fixed exposure occurs over a longer period. According to the OEHHA, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period or duration of activities associated with a project. Therefore, if the duration of proposed construction activities near a sensitive receptor was 12 months, the exposure would be less than 1½ percent of the total exposure period used for health risk calculation (i.e., 70 years).

Based on the relatively short exposure time, diesel PM generated by Project construction would not create conditions where the probability for the MEI to contract cancer is greater than ten in one million, which is the threshold the AVAQMD and SCAQMD uses for cancer risk. Likewise, the probability of construction or operations to generate ground-level concentrations of non-carcinogenic TACs that exceed a Hazard Index greater than one for the MEI is very low. Additionally, with ongoing implementation of federal and State requirements for cleaner-burning fuels, diesel engine retrofits, and new low-emission diesel engine types, the diesel PM emissions of individual equipment would be substantially reduced over future years as Project construction is implemented. This impact would be less than significant; no mitigation is required.

Impact Summary*: *Exposure to Construction Emissions. During construction of the Project, construction emissions of PM10 and PM2.5 could exceed the federal and State ambient air quality standards and SCAQMD-established local significance thresholds, exposing sensitive receptors to substantial pollutant concentrations. This impact would be significant and would be reduced with implementation of MM 11-2; however, they would not reduce impacts to a level considered less than significant. Exposure of sensitive receptors to diesel PM would be less than significant.

Valley Fever

As discussed above, Valley Fever spores have the potential to be found in soils in the Antelope Valley. The site is currently a large expanse of undeveloped land, which experiences periodic high winds and supports widespread grazing and some agricultural activity. These existing conditions result in (1) disturbance of existing soils on the site due to animal activity; (2) dust formation associated with this disturbance and high wind events; and (3) a resultant risk of Valley Fever for residents in the Project area. However, earth disturbing activities, including grading that would be required for site development, would have a more intensive

7 "Dose" is a function of the concentration of a substance or substances in the environment and the extent of exposure that a person has with the substance.

surface disturbance and would increase the risk of Valley Fever exposure if spores are present on the Project site and become airborne in fugitive dust.

The Los Angeles County Department of Public Health (DPH) divides the County into Service Planning Areas (SPA) for the purposes of tracking and reporting trends of many diseases in Los Angeles County. The Antelope Valley is included within SPA1, which reported the highest incidence rate of reported cases of Valley Fever in Los Angeles County in 2014, at 26.2 cases per 100,000 people. The Centennial Project site is within the farthest western portion of SPA 1, and is adjacent to SPA 2 (San Fernando Valley), which had a lower incidence rate of 5.7 cases per 100,000 people (LADPH 2016).

For the purposes of this analysis, it is assumed that Valley Fever spores are located within soils on the Project site. Of all construction activities that would occur on the Project site, grading is the most likely to generate airborne dust, and is therefore the most likely phase of construction to potentially release Valley Fever spores into the air. Therefore, the Project's construction workers would be at the highest risk for Valley Fever exposure, and there would be an increased risk to the existing population in the immediate vicinity of the Project area.

The control of fugitive dust is the key to preventing exposure to Valley Fever spores during ground-disturbing construction activities. Fugitive dust control measures would be required and implemented on the Project pursuant to the AVAQMD Rule 403, Fugitive Dust, and SCAQMD Rule 403, Fugitive Dust. Both of these rules require that dust be controlled so as not to be visible beyond the property line, and are enforced by the AVAQMD and SCAQMD. AVAQMD Rule 403 and SCAQMD Rule 403 control measures include watering exposed surfaces and haul roads three times daily; replacing ground cover in disturbed areas quickly; covering stock piles with tarps; and limiting speeds on unpaved roads to 15 miles per hour. The rules include comprehensive sets of best available control measures that reduce fugitive dust generation and are required for all projects within the AVAQMD's and SCAQMD's jurisdictions. Additional discussion about AVAQMD Rule 403 and SCAQMD Rule 403 is included under Threshold 11-1.

SCAQMD Rule 403 also requires that each large project identify a Dust-Control Supervisor that is employed by or contracted with the Property Owner/Developer and is on the site or within 30 minutes of the site during working hours; has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 requirements; and has both completed the SCAQMD Fugitive Dust Control Class and been issued a valid Certificate of Completion for the class. In order to ensure implementation of Rule 403 requirements, MM 3-1, in Section 5.3 Hazards and Fire Safety requires that prior to beginning any on-site construction activity, a Dust-Control Supervisor be retained who will be on the site within 30 minutes of the start of work taking place each morning; will have the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403; and will have completed the SCAQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class.

In order to further protect construction workers from infection from Valley Fever, MM 3-2 (in Section 5.3) requires the following measures:

- Hire workers from Los Angeles and/or Kern County populations, or other areas where Valley Fever is endemic, where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune.
- Prior to Project construction initiation, and for any personnel additions after initial Project construction initiation, the following California Department of Public Health (CDPH) materials on Valley Fever (or the most updated materials applicable to Los Angeles County) shall be distributed to worksite supervisors:
    - CDPH pamphlet entitled "Preventing Work-Related Coccidioidomycosis (Valley Fever)" available at: http://www.cdph.ca.gov/programs/hesis/Documents/CocciFact.pdf. (CDPH 2013a)
- Prior to Project construction initiation, and for any personnel additions after initial Project construction initiation, the following CDPH materials on Valley Fever (or the most updated materials applicable to Los Angeles County)shall be distributed to construction workers:
    - CDPH pamphlet entitled "Valley Fever Fact Sheet" available at: http://www.cdph.ca.gov/HealthInfo/discond/Documents/VFGeneral.pdf. (CDPH 2013b)
    - CDPH pamphlet entitled "Hoja de datos de la Fiebredel Valle (Valley Fever Fact Sheet in Spanish)" available at: http://www.cdph.ca.gov/HealthInfo/discond/Documents/HojaDeDatosDeLaFiebreDelValle.pdf(CDPH 2013c).
    - CDPH pamphlet entitled "Fact Sheet Valley Fever (Valley Fever Fact Sheet in Tagalog)," available at: http://www.cdph.ca.gov/HealthInfo/discond/Documents/TagalogGeneralValleyFeverFactSheet.pdf(CDPH 2013d).
- Require crews to use masks or respirators that are adequate to restrict inhalation of particulates during Project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations.
- During rough grading and construction, the access way into the Project site from adjoining paved roadways shall be paved or treated with environmentally safe dust-control agents.

While construction workers would be at highest risk, on-site populations would also be at risk for exposure during interim phases of development, depending on the proximity to on-site construction activities. As described in PDF 3-1, as implemented through MM 3-3 (in Section 5.3, Hazards and Fire Safety), prior to sale, lease, or rental of any property, all

residents would be provided with a notice disclosing this potential risk and describing strategies to avoid potential exposure to Valley Fever spores during construction or other earth-moving activities. Additionally, as required by AVAQMD Rule 403, a Supplementary Dust Control Plan is required to minimize emissions of respirable particulate matter near sensitive receptors. Measures in the supplementary plan may include, but not be limited to additional watering of active grading areas and disturbed areas; stopping operations when winds exceeding ten miles per hour are in the direction from the grading towards the receptors; and/or other effective measures.

At the completion of construction activities, risks of exposure to Valley Fever would be reduced for those living on the Project site and adjacent to the Project site due to the replacement of undeveloped land with urban development, irrigated landscaping, and paved areas, that would have reduced risks of fugitive dust generation and the associated risk of Valley Fever. Valley Fever spores have a reduced chance of becoming airborne in areas that are irrigated, vegetated with groundcover, covered with hardscapes or pavement, or urbanized with relatively little undisturbed soil (KCPHSD2015). Therefore, once the Project is completed and the landscaping is established, residents and visitors on the Project site would not have an increased risk of exposure to Valley Fever when compared to the existing conditions.

Therefore, with implementation of PDF 3-1 (from Section 5.3, Hazards and Fire Safety), AVAQMD and SCAQMD Rule 403 requirements, MM 3-1, and MM 3-2 (from Section 5.3), the potential for exposure to Valley Fever spores from construction of the Project would be reduced to the maximum extent feasible and would be considered a less than significant impact.

Impact Summary: ***Exposure to Valley Fever.*** During construction of the Project, implementation of AVAQMD and SCAQMD Rules for fugitive dust control, and MMs 3-1 and 3-2 (from Section 5.3, Hazards and Fire Safety)would result in a less than significant impact for exposure of construction workers, site occupants, and adjacent off-site persons to Valley Fever. Additionally, implementation of PDF 3-1, as implemented through MM 3-3, would result in a less than significant impact to future on-site residents.

Operations

Criteria Pollutant Emissions from On-Site Stationary Sources

The potential for the Project's stationary sources during operations to exceed ambient air quality standards is analyzed above under Threshold 11-1 (see Operations, Ambient Air Quality Standards –Stationary Sources). The analysis concludes that, with the limitations on the number and size of Project stationary sources through MM 11-1, the emissions from these sources would not exceed established ambient air quality standards and therefore would result in a less than significant impact.

Impact Summary: ***Criteria Pollutant Emissions from On-Site Stationary Sources.*** Stationary source sizes would be limited by MM 11-1. Emissions would not exceed applicable standards. Exposure of sensitive receptors to stationary source criteria pollutants would be less than significant.

Mobile Sources – Carbon Monoxide Hotspots

The potential for sensitive receptors to be exposed to substantial concentrations of vehicle-generated CO is analyzed above under Threshold 11-1, Ambient Air Quality Standards – Mobile Sources – CO Hotspots. The analyses conclude that there would be no potential CO hotspot.

Impact Summary: ***Mobile Sources – CO Hotspots***. The Project would not create or contribute to off-site traffic conditions that would cause a CO hotspot. Exposure of sensitive receptors to CO concentrations would be less than significant.

Toxic Air Contaminant Emissions from On-site Stationary Sources

This analysis of toxic air contaminants is based on the *Centennial Air Quality Analysis for Stationary Sources* prepared by ENVIRON (2009a) and is included as EIR Appendix 5.11-B. Carcinogenic risks (i.e., cancer risks) are estimated as the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk may be expressed as a unitless probability (e.g., 10 in 1 million or 10^{-5}), which is how they are expressed in this EIR discussion. By contrast, hazard indices (HIs) express the potential for chemicals to result in non-cancer health impacts, and non-carcinogenic chemicals should not be present at levels that may have the potential to cause adverse health effects (i.e., HI greater than one). HIs are expressed using decimal notation (e.g., 0.001) and express the fraction of the threshold concentration that may have the potential to cause adverse health effects.

Pursuant to SCAQMD Rule 1401(d)(1) and AVAQMD Rule 1401(E)(3)(e), the risks associated with potential exposure to emissions from a source equipped with the best available control technology for toxics (T-BACT) and from all emissions sources included within a "project" are acceptable if the incremental cancer risk is less than ten in one million, and one in one million for sources not equipped with T-BACT. Ten in one million is the limit stated in the AVAQMD and SCAQMD CEQA significance thresholds.

In the *Centennial Air Quality Analysis for Stationary Sources*, ENVIRON confirms that the *Centennial Specific Plan's* limitations on Project TAC-emitting stationary sources would ensure that upper bound risks posed to sensitive receptors are not in excess of the significance thresholds.

Evaluation of Toxic Air Contaminant Emissions in Business Parks

The 2009 *Centennial Air Quality Analysis for Stationary Sources* includes an analysis of TAC emissions in the Project Business Park areas. The analysis is based on a previous design and plans for the Project; however, the changes in the Project site and design relative to this

analysis are minor and the analysis is sufficient to evaluate potential impacts. Land use designations from the previous Centennial Land Use Plan were used to identify the locations of proposed business parks and nearby residential and other sensitive receptors. In the previous Land Use Plan, buffer areas between business park locations and sensitive receptors were established. In order to determine the number of potential TAC emission sources, these business parks were subdivided into roughly three-acre sites. For this analysis, it was assumed that each three-acre site contained one air emission source located at the center of each site. Health impacts were evaluated at the property lines of any sensitive receptor land use designations adjacent to the business parks.

TAC emissions of 165 generic sources were scaled to the maximum emissions allowed by the limits in the Project to determine the aggregate cancer risk and non-cancer hazard index at each sensitive receptor. The modeling of composite emissions from all 165 TAC sources confirmed that none of the adjacent sensitive receptors would exceed a cancer risk of 10 in 1 million or have a chronic non-cancer hazard index of 1.0.

The modeling assumes that the buffer areas would not contain TAC emission sources or sensitive receptor uses. The modeling analysis demonstrates that this restriction ensures that the 10 in 1 million threshold for the aggregate sensitive receptor cancer risk and 1.0 threshold for chronic non-cancer risk are not exceeded at adjacent sensitive source receptor areas. In order to ensure that the Project's future tract maps incorporate this required buffer area, MM 11-7 requires the establishment of buffer areas in the Project equivalent to those used for the TAC modeling.

The establishment of buffer areas does not, however, preclude the use of these buffer zones for other commercial entities, provided they are not potential sources of TAC emissions. Additionally, there may be limitations on locations where schools or daycare centers could be located within the business parks, depending on the aggregate cancer risk and chronic non-cancer hazard index within the business park subdivision. Under a worst-case scenario, no schools or daycare centers should locate in any business park areas; however, since Centennial will likely build out with sources in the business park with lower emissions than those projected by this report, the Project does not, and need not contain an absolute ban. Rather, additional analyses are required before these uses can locate there so that the actual health risks can be assessed. MM 11-8 requires this analysis and identifies required performance standards to ensure that impacts are reduced to a less than significant level. Additionally, in order to comply with the CARB recommendation that distribution centers should be at least 1,000 feet from sensitive receptors, MM 11-9 requires Distribution Centers to be located within the business park areas south of State Route (SR) 138 and at least 1,000 feet from existing sensitive receptors and lands designated for sensitive land uses. Distribution centers would not be allowed in other areas within the Project site.

It should be noted that the ENVIRON analysis presents a conservative, worst-case assessment of the maximum expected cancer risk and chronic non-cancer risk due to business park TAC emissions at any sensitive receptor location. It assumes that each allowable location for TAC emissions would use toxic chemicals at the maximum allowable rate. It is likely that the chemical use at some of these locations would be below the maximum rate, and the resultant risks would also be lower.

Evaluation of Toxic Air Contaminant Emissions in Commercial, Institutional, and Residential Areas

There are several discrete types of equipment with TAC emissions levels less than those described previously for stationary sources that would be permitted in the commercial and institutional areas on the Project site. These types of equipment include natural gas-fired boilers (a surrogate for any gas-fired equipment), emergency generators, gasoline service stations, spray booths, storage tanks, petroleum-solvent dry cleaners, small-source particulate matter (PM) generators, and wastewater reclamation facilities (WRFs). A modeling analysis was performed to confirm that the aggregate risk from these TAC-emitting sources remains below significance thresholds. In order to account for the possibility of a receptor being exposed to impacts from more than one source, individual units are limited in size by the Project to those that would result in risks less than one-tenth of the significance threshold (i.e., cancer risk of no more than 1 in 1 million and an HI of no more than 0.1) at its point of maximum impact (PMI). The methodology for conducting this analysis is described in Appendix 5.11-B.

If the Project were to include TAC emissions sources that do not meet the recommended sizes and operations, there would be a potential that the aggregate risk from these TAC-emitting sources would exceed identified significance thresholds. MM 11-1 requires compliance with these parameters which are included in Table 5.11-5. As stated in MM 11-1, should there be a need or request for a stationary source exceeding the prescribed limits, a source-specific air quality analysis in accordance with the applicable AVAQMD or SCAQMD Rules would be required.

Two WRFs would be constructed (one to the west and one to the east of the West Branch of the Aqueduct) to provide tertiary treated recycled water for community landscaping throughout the Project site. WRFs emit TACs; the types and relative quantities emitted depend on the chemical makeup of the influent wastewater sent to the treatment plant.

A screening health risk assessment was conducted to evaluate the air concentration at the nearest sensitive receptors to the WRFs. (The modeling methodology is described in Appendix 5.11-B.[8]) Because the future operating characteristics of the WRFs can be estimated (thus not requiring a safety factor to account for uncertainty) and because the plants would be located in institutional areas where there are not expected to be other TAC-emitting equipment contributing to composite risks, the relevant thresholds for the WRFs are 10 in 1 million for cancer risk and 1.0 for the chronic non-cancer HI. Cancer risk calculations were conservatively calculated for a maximum resident period of 70 years. The results of the screening analysis demonstrate that the estimated incremental cancer risk, chronic and acute health indexes from all WRFs would be less than the significance thresholds at the maximally exposed sensitive receptor location. Impacts from TAC emissions generated by the WRFs would be less than significant.

8 The location of the west WRF would be slightly different than the location shown in Appendix 5.11-B, but the TAC analysis is valid for either location.

Off-Site Impacts

Construction

Construction of the off-site Project features described in Section 4.7 of the EIR (i.e., roadway improvements, water infrastructure, and utilities connections) would generate short-term diesel PM TAC emissions. As described above for on-site construction, the duration of construction activities near any sensitive receptor would be small when compared to the exposure durations considered for a potential health risk. Off-site construction activities would be much less in magnitude and duration than on-site construction. Therefore, the TAC impact from off-site construction would be less than significant.

Operational Impacts

Upon completion of construction, the Project's off-site roadway, water infrastructure, and utility improvements would not generate TACs. There would be no impact.

Impact Summary: ***Toxic Air Contaminants.*** MM 11-1 prescribes limits on larger sources and all TAC sources are limited by AVAQMD Rule 1401 and SCAQMD Rule 1401. The analysis demonstrates that, with implementation of MM 11-7, MM 11-8, and MM 11-9, impacts of these sources would be less than the applicable incremental cancer risk and non-cancer health index thresholds. Exposure of sensitive receptors to TACs from on-site sources would be less than significant

Toxic Air Contaminant Emissions from Existing Off-Site Sources

The National Cement Company's Lebec Plant was identified as the only stationary source in the Project vicinity with the potential to emit TACs. Due to the plant's proximity to the Centennial Project, it was deemed appropriate to assess any potential impact to the Project site associated with the Plant. In November 2005, ENVIRON prepared a technical memorandum entitled "Evaluation of Air Impacts for the National Cement Company of California's Lebec Kiln Permit Modification From a 25 percent Tire-Derived-Fuel Permit Limit to a 50% Limit" (see Appendix 5.11-C). As part of the evaluation, ENVIRON conducted a health risk analysis (HRA) to evaluate the human health impact from increasing the percentage of tire-derived-fuel (TDF) used at the NCCC facility at Lebec. In that HRA, ENVIRON used standard methods developed by the OEHHA (e.g., Hot Spots Analysis Reporting Program [HARP]) to evaluate cancer risks and non-cancer health hazards at the closest potential future Project residence, which is located at the northernmost point of the Project site (i.e., the portion of Centennial closest to the Plant).

Based on the results presented in the HRA, the estimated cancer risks and chronic and acute non-cancer HIs at the future Project residences and other sensitive uses (after Centennial Buildout) are below the AVAQMD's and SCAQMD's thresholds for significant risk (i.e., 10 in 1 million for cancer risk and 1.0 for HI). The cancer risk at the northernmost portion of the Project site was estimated to be 0.15 in 1 million; the chronic and acute non-cancer hazard indices estimated for this location were 0.01 and 0.12, respectively. Based on the results

presented in the HRA, the Plant at Lebec is not expected to cause unacceptable risks to future residents at Centennial (ENVIRON 2009b).

In December 2008, the OEHHA modified the acute and chronic non-cancer reference exposure levels (RELs) for formaldehyde and acrolein to reflect the current understanding of their non-cancer effects. Both RELs were increased, reflecting the fact that both compounds are considered to have lower non-cancer toxicity than previously believed. Since the HRA was last updated in December 2005, these revised RELs are not reflected in the HIs calculated in that HRA. If the analyses were updated with the new RELs, the resulting chronic and acute hazard indices (HIs) at the nearest residence will be less than the 0.01 and 0.12, respectively, which are the previous estimates. For the other chemicals identified in the HRA, ENVIRON determined that no OEHHA-published toxicity values have been modified since the HRA was issued (ENVIRON 2009b). Therefore, absent an increase in the emissions from the NCCC facility or a change in process that alters the emissions makeup, the health risks presented in the HRA would likely be lower and conclusions reached still continue to be valid.

Impact Summary: ***Toxic Air Contaminants – Off-Site Sources.*** The TAC risks from the National Cement Plant at Lebec to the Project site would be less than the applicable AVAQMD and SCAQMD CEQA significance thresholds. The impact would be less than significant.

Diesel Particulate Matter Exposure from Vehicles on State Route 138

The CARB publication, *Air Quality and Land Use Handbook: A Community Perspective* recommends default separation distances when locating new sensitive land uses near sources of TACs, including freeways. The CARB guidance recommends 500-foot buffers between freeways and sensitive receptors, indicating that further analyses may be necessary if the proposed sensitive land use is located within this recommended buffer. The bases for this recommendation include epidemiological studies demonstrating additional cancer and non-cancer health risks associated with proximity to roadways, and attributing the risk to diesel PM. The CARB guidance manual states that the highest concentration of pollutants emitted from freeways dissipates rapidly within the first 300 feet of a freeway. According to CARB, California freeway studies also show an approximate 70 percent drop off in particulate pollution levels at 500 feet, and lifetime cancer risk from exposure to diesel PM is expected to be lowered proportionately. The guidance manual does not provide a quantitative acceptable threshold of risks from diesel PM from freeways in its recommendations of buffer distances between freeways or high traffic roadways and sensitive land uses, nor does it discuss the important factor of meteorology, which substantially affects pollutant concentrations if receptors are upwind or downwind of a freeway.

MM 11-10 requires the implementation of PDF 11-6, which prohibits the development of residences, schools, day care centers, or other land uses involving public congregation within 150 feet from the near edge of the traffic lanes of SR-138.

As discussed in the Methodology section and Appendix 5.11-C, ENVIRON conducted dispersion modeling to estimate diesel PM air concentrations at sensitive receptors (e.g., planned future residences and institutional locations that could contain schools or hospitals) located adjacent to SR-138. Concentrations were evaluated for two scenarios: "With Project" and "Without Project". The With Project scenario includes a realigned and expanded SR-138 configuration, consistent with the proposed Northwest 138 Corridor Improvement Project (described in Section 4.5.5 of this EIR). The Northwest 138 Corridor Improvement Project evaluates operational improvements for SR-138 from I-5 to SR-14. Metro and Caltrans are preparing a Draft EIR/EIS for alternative improvements to this highway that would include a 6-lane freeway (with a curve correction) that includes a 22-foot median in the vicinity of the Project site (Metro 2015).The Without Project scenario would not change the current roadway configuration.

Because the Project would generate traffic on SR-138, the receptors evaluated included 3 existing residences within 500 feet of SR-138, as well as the proposed residential and institutional areas that could be located within 150 feet of the freeway. Cancer risks were calculated for the modeled sensitive receptors assuming a 30-year exposure duration, which represents a high-end residency period, and a 70-year exposure scenario, which represents a maximum, lifetime exposure. The health risks associated with non-carcinogenic effects were evaluated by comparing the maximum annual concentration to the OEHHA-established non-cancer chronic REL.

As discussed in greater detail in Appendix 5.11-C, *Centennial Supplemental Air Quality Analysis,* of this EIR, the analysis of diesel PM risks from SR-138 to future sensitive receptor areas shows incremental cancer risks for the 70-year exposure duration below 10 in 1 million at locations greater than 150 feet from the travel lanes. The estimated hazard index for all proposed sensitive receptors was less than one. As more stringent vehicular greenhouse gas emission and criteria air pollution standards take effect, the number of diesel powered vehicles on roadways as well as emissions from remaining newer diesel engines will further reduce diesel-related health risks. Therefore, the analysis confirms that the 150-foot buffer limitation established by MM 11-10 would ensure that diesel PM TAC impacts would be less than significant. In addition, MM 11-11 requires that prior to future tract map approvals, if any sensitive receptors (e.g. residential, day care, schools, hospitals) would be located within 500 feet of the SR-138, an additional dispersion modeling study must be conducted to estimate diesel PM air concentrations. If the study finds that diesel PM TAC emissions would be significant at the location of a proposed sensitive receptor, then effective construction measures must be implemented into the structures to mitigate for interior air quality, such as MERV13 filters or equivalent protections against TACs from vehicle emissions.

The results for the three existing residences are summarized in Table 5.11-24, Incremental Health Risks from Diesel PM to Existing Residences.

TABLE 5.11-24
INCREMENTAL HEALTH RISKS FROM DIESEL PARTICULATE MATTER TO EXISTING RESIDENCES

Residence ID*	Incremental Cancer Risks (Per One Million)		Incremental Chronic Hazard Index
	30-Year	70-Year	
1	0.2	0.6	0.0003
2	-1.1	-2.5	-0.002
3	0.2	0.5	0.0003

* Residence locations are shown in Appendix 5.11-C.
Source: Environ 2009b

As shown in Table 5.11-24, the highest estimated cancer risk at any of the 3 existing residences is 0.6 in 1 million at Residence 1; the increase is for 70-year exposure. The risks to Residence 2 would decrease with the Project, as the new location of SR-138 would be slightly further from the residence than the current location.

Impact Summary: ***Toxic Air Contaminants – Diesel PM from SR-138.*** The Project would include land use areas that could allow sensitive receptors to be located adjacent to SR-138. Vehicles on SR-138 emit diesel PM, which is a TAC. MM 11-10 prohibits the development of sensitive receptors within 150 feet of SR-138. MM 11-11 requires additional TAC study for sensitive receptors within 500 feet of the SR-138. With these measures, exposure of sensitive receptors to TACs from SR-138 would be less than significant.

Threshold 11-3 Would the proposed project conflict with or obstruct implementation of the applicable air quality plan?

On-Site Impacts

Section 15125 of the State CEQA Guidelines requires an EIR to discuss any inconsistencies between the Project and applicable regional plans, which include air quality management plans and the State Implementation Plan (SIP). As discussed above, both the AVAQMD and SCAQMD have adopted air quality management plans that include strategies for reducing nonattainment criteria pollutant emissions to meet the NAAQS and CAAQS by a specified date. The *AVAQMD Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Non-Attainment Area)* and the SCAQMD 2012 AQMP are the most recent AQMPs for the respective Districts. Both documents rely on Southern California Association of Government (SCAG) growth forecasts to predict baseline inventories for mobile, area, and stationary sources. The analysis below discusses the Project's consistency with the assumptions and objectives of these applicable air quality plans and whether implementation of the Project would interfere with the AVAQMD's or SCAQMD's ability to comply with State and federal air quality standards.

The AVAQMD's CEQA and Federal Conformity Guidelines state "A project is deemed to not exceed this threshold, and hence not be significant, if it is consistent with the existing land use plan. Zoning changes, specific plans, general plan amendments and similar land use plan changes which do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not exceed this threshold" (AVAQMD 2016b).

Population associated with the Project was not in the 2004 SCAG growth forecasts, upon which the basic AVAQMD *Federal 8-Hour Ozone Attainment Plan* was based. However, the 2008, 2012, and 2016 SCAG growth forecasts have accounted for the Project and emissions associated with the Project will be accounted for in future SCAQMD and AVAQMD AQMPs that are adopted prior to the buildout for the Project. AQMP revisions are required at least once every three years. Therefore, revised plans, which would include the Project's population and emissions forecasts, would be in place prior to the initial occupancy of Project facilities.

The SCAQMD guidelines also specify that, for consistency with the AQMP, a project will not result in an increase in the frequency or severity of existing air quality violations; will not cause or contribute to new violations; and will not delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP. Construction-related emissions are assumed to occur throughout the geographic region covered by the AQMP, and the AQMP is focused on operational emissions. As described under Threshold 11-1, the limitations for specific sources specified in MM 11-1 are sufficient to ensure that any individual source or a combination of adjacent sources would not result in a violation of an ambient air quality standard. Sources larger than the limitations set forth in the *Centennial Specific Plan* could be operated without exceeding air quality standards; however, the MM 11-1 requires an additional assessment of the potential impacts of that source prior to its operation. As discussed above, Project operational emissions are also consistent with the population, housing, and employment assumptions in the SCAG RTP/SCS, which is the criteria emission estimates included in the AQMP. Therefore, the Project would not conflict with the AQMP population projections at the time of Project implementation, operational impacts would be less than significant.

Off-Site Impacts

Construction and operation of the off-site Project features are not population-generating land uses; therefore, these components would be consistent with the AVAQMD and SCAQMD AQMPs. There would be no impacts related to consistency of off-site Project features with the applicable air quality plans.

Impact Summary: The Project and the associated population and emissions are in current SCAG growth forecasts, and will be included in future AQMPs. There would be no conflict with AQMPs and the impact would be less than significant.

Threshold 11-4 Would the proposed project create objectionable odors affecting a substantial number of people?

On-Site Impacts

Construction Phases

Project construction would use equipment and activities that would generate odors typical during construction and not extraordinarily objectionable. Potential construction odors include on-site construction equipment's diesel exhaust emissions as well as roofing, painting, and paving operations. Because the Project is new development (as opposed to infill), it is likely that most construction activities will occur at some distance from occupied residences and businesses. However, there will be situations where construction activity odors will be noticed. These odors would be temporary and would dissipate rapidly from the source with an increase in distance. Therefore, the impacts would be short-term; would not affect a substantial number of people; and would be less than significant.

Long-Term Impacts

During long-term Project operations, some odors associated with residential uses would be expected to occur, such as from cooking and gardening. However, those odors are not considered significant on a local or regional scale. Local odors would be no different than in any other residential area with supporting services and would not be considered significant.

The most likely potential nuisance odors would be from the industrial or utility sources, including the WRFs and the Materials Recovery Facility/Transfer Station (MRF/TS). The two WRFs would be located along the northern edge of the Project site; see Exhibit 4-14, Centennial Project – Conceptual Wastewater System. The location of the MRF/TS, if constructed, has not been determined, but would be located within the Utility land use designation.

Anaerobic microbial decomposition of material in the wastewater and solid waste stream could generate emissions of hydrogen sulfide, which has a characteristic rotten egg odor, and other odorous compounds. Hydrogen sulfide is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing hydrogen sulfide at levels above the State standard will result in exposure to a very disagreeable odor. In 1984, a CARB committee concluded that the ambient standard for hydrogen sulfide is adequate to protect public health and to significantly reduce odor annoyance. Decomposition of nitrogen compounds in wastewater can also generate emissions of ammonia, which has a pungent odor.

Prior to their construction and operation, the WRFs and the MRF/TS would be required to obtain construction and operation permits from the SCAQMD or AVAQMD, depending on the location of each facility, to ensure that their air quality and odor impacts would be less than significant. To minimize odors from these facilities to less than significant levels, state-of-the art design and odor-control measures would be implemented where necessary. Examples of effective odor-control technologies include covering and/or enclosing odorous processes,

applying negative air pressure with blowers, and installing odor-control devices such as biofilters, chemical scrubbers, or activated carbon filters. Digester gas, which is primarily methane, can be either flared or used as an industrial fuel. Digester gas combustion would destroy odorous compounds. Both the SCAQMD and AVAQMD have regulations that prohibit off-site odors generated by any source. Any detectable odors outside the boundary of either the WRFs or the MRF/TS would be a violation of the air districts' rules and regulations.

Off-Site Impacts

Project off-site roadway, water infrastructure, and utility improvements would not generate odors and would not require air quality permits for their operation. The off-site wells would not generate odors and would not require air quality permits for their operation. There would be no permanent population at the wells to be exposed to objectionable odors in the area. Construction of the proposed wells may result in short-term odors typical of construction, including diesel and paving odors in the immediate vicinity of the construction area. There would be no substantial populations nearby to be exposed to these odors. Therefore, there would be no impacts related to generating odors or to introducing a future population to nuisance odors or hazardous air emissions.

***Impact Summary*:** Construction activity odors would be temporary and would not be experienced by a substantial number of people. The WRFs and the MRF/TS would be facilities with the potential to emit objectionable odors. The Project must comply with review and permitting by the AVAQMD or SCAQMD, as applicable, with respect to odor impacts. Construction and operational on-site and off-site odor impacts would be less than significant.

Threshold 11-5 Would the proposed 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

On-Site and Off-Site Impacts

As previously identified in Table 5.11-2, the MDAB is in nonattainment for PM10 and O_3. As previously identified in Table 5.11-3, the Los Angeles County portion of the SoCAB is in nonattainment for PM10, PM2.5, lead, and O_3. The Project would contribute PM10, PM2.5, and O_3 precursors (i.e., VOC and NOx) to the area during short-term construction and long-term operational activities. Lead emissions would be negligible. However, even with the inclusion of mitigation measures for direct impacts, the Project's emissions would be cumulatively considerable.

The AVAQMD CEQA guidelines state that "cumulative impacts are similar to direct and indirect impacts of the project, which the project contributes to" (AVAQMD 2016b). In the case of a subdivision project, a given project has a cumulative impact with all other subdivision projects, from the standpoint of each type of impact (e.g., cumulative

construction emissions, residential natural gas consumption, solvent use, transportation emissions, congestion).The SCAQMD considers the thresholds for project-specific impacts and cumulative impacts to be the same (SCAQMD 2003b).[9]

Construction annual emissions of NOx, an O_3 precursor, would be directly significant and therefore, cumulatively considerable and significant. Construction daily emissions of O_3 precursors VOC and NOx, would be directly significant and therefore, cumulatively considerable and significant. Even with the inclusion of mitigation measures for direct impacts, these Project emissions would be cumulatively considerable. Construction mass emissions of PM10 and PM2.5 would not be directly or cumulatively significant.

Even with the inclusion of mitigation measures, long-term operational emissions of PM10, PM2.5, and O_3 precursors VOC and NOx, would be directly significant and therefore, cumulatively considerable and significant.

5.11.8 MITIGATION MEASURES

MM 11-1 The Project's plans and specifications shall require stationary sources to comply with the parameters stated in Stationary Source Types, Size Limits, and Quantity Estimates, which is included as Attachment A to the Project's Mitigation Monitoring and Reporting Program. Should there be a need for a stationary source exceeding the prescribed limits, the Project Applicant/Developer shall apply for source-specific permit from the Antelope Valley Air Quality Management District (AVAQMD) or South Coast Air Quality Management District (SCAQMD), as applicable.

MM 11-2 The Project's plans and specifications shall include the following measures to minimize nitrogen oxide (NOx) and volatile organic compound (VOC) emissions during construction:

- All off-road diesel-powered construction equipment greater than 50 horsepower shall meet U.S. Environmental Protection Agency (USEPA) Tier 4 Final emission standards to the extent that the equipment is available. In addition, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by the California Air Resources Board (CARB). Any emissions-control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. If Tier 4 Final equipment is not available, the Project Applicant/Developer shall provide the County with documentation showing the reasons for non-availability.
- Alternatively, construction equipment may be selected according to the Green Construction Policy used by the Los Angeles County Metropolitan Transportation Authority or the ports of Los

9 The only exception is the hazard index significance threshold for toxic air contaminants.

Angeles/Long Beach. These policies include provisions to 'step down' from Tier 4 equipment to Tier 3 or Tier 2 if specified criteria are met.

- Require the use of 2010 and newer diesel haul trucks (e.g., material delivery trucks and soil import/export). If the Project Applicant/Developer determines that 2010 model year or newer diesel trucks cannot be obtained, trucks that meet USEPA 2007 model year NOx emissions requirements shall be required. If 2010 model year or newer diesel trucks are not available, the Project Applicant/Developer shall provide the County with documentation showing the reasons for non-availability.
- A copy of each unit's certified tier specification, BACT documentation, and CARB or District operating permit shall be provided to the County at the first occurrence of mobilization of each applicable unit of equipment.
- Construction contractors shall ensure construction equipment is properly serviced and maintained to the manufacturer's standards.
- Construction contractors shall limit non-essential idling of construction equipment to no more than five consecutive minutes.

MM 11-3 The Project's plans and specifications shall prohibit wood-burning fireplaces as required by SCAQMD Rule 445 in single-family residences throughout the entire Project site, including at residences that are 3,000 or more feet above mean sea level at which the SCAQMD prohibition would otherwise not apply. Natural gas fireplaces shall be limited to a total of 13,954.

MM 11-4 The Project's plans and specifications for non-residential buildings shall demonstrate that the following features have been incorporated into the building designs. Proof of compliance shall be provided to the County prior to the issuance of occupancy permits.

- For buildings with over 10 tenant-occupants, changing/shower facilities shall be provided as specified in Section A5.106.4.3, Nonresidential Voluntary Measures, of the CALGreen Code as follows: for 11 to 100 tenant-occupants, one unisex shower; for 101 to 200 tenant-occupants, one shower per gender; and for over 200 tenant-occupants, one shower per gender for each 200 additional tenant-occupants.
- Preferential parking for low-emitting, fuel-efficient, and carpool/van vehicles shall be provided as specified in Section A5.106.5.1, Nonresidential Voluntary Measures, of the CALGreen Code as follows: two for 10 to 15 spaces; four for 26 to 50 spaces; six for 51 to 75 spaces; nine for 76 to 100 spaces; eleven for 101 to 150 spaces; 18 for 151 to 200 spaces; and at least 10 percent of total for 201 and more spaces.

- Facilities shall be installed to support future electric vehicle charging at each non-residential building with 30 or more parking spaces. Installation shall be consistent with Section A5.106.5.3, Nonresidential Voluntary Measures (Tier 1), of the CALGreen Code. The facilities shall meet Section 406.9 (Electric Vehicle) of the *California Building Code* and as follows:

  Single charging space requirements. When only a single charging space is required, install a listed raceway capable of accommodating a dedicated branch circuit. The raceway shall not be less than trade size 1. The raceway shall be securely fastened at the main service or subpanel and shall terminate in close proximity to the proposed location of the charging system into a listed cabinet, box or enclosure.

  Multiple charging spaces required. When multiple charging spaces are required, plans shall include the location(s) and type of electrical vehicle supply equipment (EVSE), raceway method(s), wiring schematics and electrical calculations to verify that the electrical system has sufficient capacity to charge simultaneously all the electric vehicles (EV) at all designated EV charging spaces at their full rated amperage. Plan design shall be based on Level 2 EVSE at its maximum operating ampacity. Provide raceways from the electrical service panel to the designated parking areas which are required to be installed at the time of construction.

MM 11-5 The Project's plans and specifications for residential buildings shall demonstrate that the following features have been incorporated.

- Visitor parking shall include preferentially located parking spaces for alternative-fueled vehicles.
- Exterior electrical receptacles and natural gas or propane hookups.
- Bicycle parking shall be provided as specified in Section A4.106.9, Residential Voluntary Measures, of the CALGreen Code, as follows:

  Short-term bicycle parking. Provide permanently anchored bicycle racks within 100 feet of the visitor's entrance, readily visible to passers-by, for five percent of visitor motorized vehicle parking capacity within a minimum of one two-bike capacity rack.

  Long-term bicycle parking for multifamily buildings. Provide on-site bicycle parking for at least one bicycle per every two dwelling units. Acceptable parking facilities shall be conveniently reached from the street and may include, but not limited to:

  1. Covered, lockable enclosures with permanently anchored racks for bicycles.
  2. Lockable bicycle rooms with permanently anchored racks.
  3. Lockable, permanently anchored bicycle lockers.

Long-term bicycle parking for hotel and motel buildings. Provide one on-site bicycle parking space for every 25,000 square feet, but not less than two. Acceptable parking facilities shall be conveniently reached from the street and may include, but not be limited to:

1. Covered, lockable enclosures with permanently anchored racks for bicycles.
2. Lockable bicycle rooms with permanently anchored racks.
3. Lockable, permanently anchored bicycle lockers.

MM 11-6 The Project's plans and specifications for parking structures and parking lots with 20 or more parking spaces shall demonstrate that the following features have been incorporated into the parking facility.

- The parking facility shall include a minimum of five percent preferentially located parking spaces for alternative-fueled (electric, natural gas, or similar low-emitting technology) vehicles.
- The parking facility shall include at least one electric vehicle charging station. Electrical lines shall be designed and sized to add additional charging stations for up to three percent of the total parking spaces when a demand is demonstrated. The design and installation shall be consistent with Section A4.106.8.2, Residential Voluntary Measures, of the CALGreen Code as follows:

  Single charging space requirements. When only a single charging space is required, install a listed raceway capable of accommodating a dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall be securely fastened at the main service or subpanel and shall terminate in close proximity to the proposed location of the charging system into a listed cabinet, box or enclosure.

  Multiple charging spaces required. When multiple charging spaces are required, plans shall include the location(s) and type of electrical vehicle supply equipment (EVSE), raceway method(s), wiring schematics and electrical calculations to verify that the electrical system has sufficient capacity to charge simultaneously all the electric vehicles at all designated EV charging spaces at their full rated amperage. Plan design shall be based on Level 2 EVSE at its maximum operating ampacity. Only underground raceways and related underground equipment are required to be installed at the time of construction.
- For residential parking facilities, bicycle parking shall be provided as specified in Section A4.106.9, Residential Voluntary Measures, of the CALGreen Code.

MM 11-7 The Project's plans and specifications for business park or water reclamation facility land uses shall demonstrate that buffer areas adjacent to proposed business parks in compliance with the Air Quality Analysis for Stationary Sources Allowed by the Centennial Specific Plan, (see Appendix 5.11-B of this EIR) have been incorporated into the design plans. The buffer areas shall prohibit uses that are potential sources of toxic air contaminants and shall prohibit uses that include sensitive receptors, except as allowed through written evidence that the sensitive use would not be exposed to Toxic Air Contaminants with pollutant concentrations resulting in a cancer risk greater than or equal to 10 in 1 million for health risks and 1.0 for non-cancer chronic and acute hazard indices (HIs).

MM 11-8 Prior to approval of any tract map that includes an air quality sensitive use (e.g., school, hospital, daycare center) within a designated business park, the Project Applicant/Developer shall provide written evidence to the County that the sensitive use would not be exposed to Toxic Air Contaminants with pollutant concentrations resulting in a cancer risk greater than or equal to 10 in 1 million for health risks and 1.0 for non-cancer chronic and acute hazard indices (HIs).

MM 11-9 The Project's plans and specifications shall demonstrate that all distribution centers are within the business park areas south of State Route (SR) 138 and are located at least 1,000 feet from existing sensitive receptors and lands designated for sensitive land uses. Distribution centers shall not be allowed in other areas within the Project site.

MM 11-10 The Project's plans and specifications shall demonstrate that any land uses involving the public congregation of sensitive receptors (e.g. residential, schools, hospital, daycare center) are not within 150 feet of the near edge of the SR-138 traffic lanes.

MM 11-11 Prior to the approval of any tract map that includes an air quality sensitive receptor (e.g. residential, day care, schools, hospital) located within 500 feet of the SR-138, the Project Applicant/Developer shall provide a dispersion analysis to calculate the health risks from vehicle emissions from SR-138. If the study concludes that health risks would be significant at the location of a proposed sensitive receptor, then effective design measures must be implemented into the structures to mitigate for interior air quality, such as ventilation systems that include MERV13 filters or equivalent protections against TACs from vehicle emissions. Confirmation of compliance shall be provided to the County prior to occupancy that include sensitive receptors within 500 feet of the SR-138.

5.11.9 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of identified MMs, the following impacts would remain significant and unavoidable:

- Construction emissions would exceed the AVAQMD annual NOx emissions threshold and the daily SCAQMD VOC and NOx thresholds. VOC and NOx (both O_3 precursors) would be directly significant and therefore, cumulatively considerable and significant.
- Long-term operational emissions, including area, energy, and mobile sources, of CO, VOC, NOx, PM10, and PM2.5 would exceed AVAQMD mass annual emissions thresholds of significance and SCAQMD mass daily emissions thresholds of significance.
- Construction near previously completed and occupied residences could result in exceedance of ambient air quality standards and exposure of sensitive receptors to substantial local pollutant emissions of PM10 and PM2.5.

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