4.3 AIR QUALITY

This section describes existing air quality conditions, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to implementation of the Sustainability Policy and Regulatory Update of the County of Santa Cruz (County) General Plan and Local Coastal Program (LCP) and County Code (Sustainability Update or project). The analysis is based on air quality modeling conducted for the proposed project (see Appendix I).

4.3.1 Environmental Setting

4.3.1.1 Meteorological and Topographical Conditions

Santa Cruz County is in the North Central Coast Air Basin (Air Basin), which encompasses an area of 5,159 square miles and consists of Monterey, Santa Cruz, and San Benito counties. The northwest sector of the Air Basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary and, together with the southern extent of the Santa Cruz Mountains, forms the Santa Clara Valley, which extends into the northeastern tip of the Air Basin. Farther south, the Santa Clara Valley merges into the San Benito Valley, which extends northwest–southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to King City at the southeast end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley. The coastal Santa Lucia Range defines the western side of the valley (Monterey Bay Air Resources District [MBARD[1]] 2008). This series of mountain ranges and valleys influences the dispersion of criteria air pollutants through the Air Basin.

The semi-permanent Pacific High pressure cell in the eastern Pacific is the basic controlling factor in the climate of the Air Basin. In the summer, the Pacific High pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High pressure cell forming a stable temperature inversion of hot air over a cool coastal layer of air. As the air currents move onshore, they pass over cool ocean waters and bring fog and relatively cool air into the coastal valleys. The warmer air above acts as a lid to inhibit vertical air movement.

During the summer, the generally northwest–southeast orientation of mountainous ridges tends to restrict and channel the onshore air currents. Elevated ground-surface temperatures in the interior portion of the Salinas and San Benito valleys create a weak low pressure area that intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay Area or the Central Valley into the

[1] Formerly Monterey Bay Air Pollution Control District.

Air Basin. During the winter, the Pacific High migrates southward and has less influence on the Air Basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually results in good air quality for the Air Basin in winter and early spring (MBARD 2008).

4.3.1.2 Pollutants and Effects

Criteria Air Pollutants

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

Ozone

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

2 The descriptions of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (EPA 2018), CARB's Glossary of Air Pollutant Terms (CARB 2019a), and CARB's "Fact Sheet: Air Pollution Sources, Effects and Control" (CARB 2009).

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

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

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies of O_3's effects on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2019b).

Nitrogen Dioxide and Oxides of Nitrogen

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

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards (AAQS) for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher levels of exposure compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2019c).

Carbon Monoxide

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

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2019d).

Sulfur Dioxide

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

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. The elderly and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2019e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (National Research Council of the National Academies [NRC] 2005). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than in healthy people, and it increases with the severity of their asthma (NRC 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter

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

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

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

Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017).

Lead

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

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

Sulfates

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

Vinyl Chloride

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

Hydrogen Sulfide

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

Visibility-Reducing Particles

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

Reactive Organic Gases

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

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

Non-Criteria Air Pollutants

Toxic Air Contaminants

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

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

Diesel Particulate Matter

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2019f). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known carcinogenic organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2019d). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 California Code of Regulations [CCR] Section 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars; and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2019f). Those most vulnerable to non-cancer health effects are children, whose lungs are still developing, and the elderly, who often have chronic health problems.

Odorous Compounds

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

4.3.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. The term “sensitive receptors” is used to refer to facilities and structures where people who are sensitive to air pollution live or spend considerable amounts of time. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). Sensitive receptors such as these are located throughout the county.

4.3.1.4 Existing Air Quality Conditions

North Central Coast Air Basin Attainment Designations

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as “attainment” or “nonattainment” for each criteria air pollutant, based on whether the National Ambient Air Quality Standard (NAAQS) have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as attainment for that pollutant. If an area exceeds the standard, the area is classified as nonattainment for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as “unclassified” or “unclassifiable.” The designation of “unclassifiable/attainment” means that the area meets the standard or is expected to meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards.

Similar to the federal Clean Air Act, the California Clean Air Act provides for the designation of areas as attainment or nonattainment, but based on the California Ambient Air Quality Standard (CAAQS) rather than the NAAQS. Table 4.3-1 identifies the current attainment status of the Air Basin, including the project area, with respect to the NAAQS and CAAQS, and the attainment classifications for the criteria pollutants.

The Air Basin is designated as a non-attainment area for the state PM_{10} standards. The Air Basin is designated as unclassified or attainment for all other state and federal standards (EPA 2021a; CARB 2021a). Since the Air Basin has met all NAAQS, it is no longer subject to federal conformity requirements (MBARD 2008).

Table 4.3-1. North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
National Standards		
O_3	8 hours	Unclassifiable/Attainment
NO_2	1 hour, annual arithmetic mean	Unclassifiable/Attainment
CO	1 hour; 8 hours	Unclassifiable/Attainment
SO_2	24 hours; annual arithmetic mean	Unclassifiable/Attainment
PM_{10}	24 hours	Unclassifiable/Attainment
$PM_{2.5}$	24 hours; annual arithmetic mean	Unclassifiable/Attainment
Lead	Quarter; 3-month average	Unclassifiable/Attainment
California Standards		
O_3	1 hour; 8 hours	Attainment
NO_2	1 hour; annual arithmetic mean	Attainment
CO	1 hour; 8 hours	Unclassified
SO_2	1 hour; 24 hours	Attainment
PM_{10}	24 hours; annual arithmetic mean	Nonattainment
$PM_{2.5}$	Annual arithmetic mean	Attainment
Lead	30-day average	Attainment
SO_4	24 hours	Attainment
H_2S	1 hour	Unclassified
Vinyl chloride	24 hours	No designation
Visibility-reducing particles	8 hours (10:00 a.m.–6:00 p.m.)	Unclassified

Sources: CARB 2021a (California); EPA 2021a (national).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_4 = sulfates; H_2S = hydrogen sulfide.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across California. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Table 4.3-2 presents the most recent background ambient air quality data from 2018 to 2020. The Santa Cruz monitoring station, located at 2544 Soquel Avenue, Santa Cruz, California, monitors O_3 and $PM_{2.5}$. The San Lorenzo Valley Middle School monitoring station, located at 7179 Hacienda Way, Felton, California, also monitors $PM_{2.5}$. The nearest station that monitors CO and NO_2 in the Air Basin is located at 855 E Laurel Drive, Salinas, California. The nearest station that monitors PM_{10} in the Air Basin is located at 1979 Fairview Road, Hollister, California. The data collected at these stations is considered generally representative of the air quality experienced in the vicinity of the county. This data is shown in Table 4.3- and includes the number of days that the ambient air quality standards were exceeded.

Table 4.3-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2018	*2019*	*2020*
Ozone (O_3) – Santa Cruz Monitoring Station				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.075	0.068	0.070
Number of days exceeding state standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.061	0.059	0.058
	0.070 ppm (federal)	0.061	0.059	0.057
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Nitrogen Dioxide (NO_2) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	0.18 ppm (state)	0.047	0.030	0.032
	0.100 ppm (federal)	0.047	0.030	0.032
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (state)	0.005	0.004	0.004
	0.053 ppm (federal)	0.005	0.004	0.004
Carbon Monoxide (CO) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	20 ppm (state)	3.5	35	1.6
	35 ppm (federal)	3.5	35	1.6
Number of days exceeding state standard (days)		*0*	*ND*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	1.2	5.3	1.2
	9 ppm (federal)	1.2	5.3	1.2
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Fine Particulate Matter ($PM_{2.5}$) – Santa Cruz Monitoring Station				
Maximum 24-hour concentration ($\mu g/m^3$)	35 $\mu g/m^3$ (federal)	92.0	21.3	90.4
Number of days exceeding federal standard[a]		*9.9 (9)*	*0.0 (0)*	*13.0 (13)*
Annual concentration ($\mu g/m^3$)	12 $\mu g/m^3$ (state)	8.2	6.5	8.2
	12.0 $\mu g/m^3$ (federal)	8.3	6.5	8.1
Fine Particulate Matter ($PM_{2.5}$) – San Lorenzo Valley Middle School Monitoring Station				
Maximum 24-hour concentration ($\mu g/m^3$)	35 $\mu g/m^3$ (federal)	84.4	16.8	387.8

Table 4.3-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2018	*2019*	*2020*
Number of days exceeding federal standard[a]		*6.5 (6)*	*0.0 (0)*	*19.5 (19)*
Annual concentration (µg/m³)	12 µg/m³ (state)	6.6	4.7	11.2
	12.0 µg/m³ (federal)	6.5	4.7	10.9
Coarse Particulate Matter (PM_{10}) – Hollister Monitoring Station				
Maximum 24-hour concentration (µg/m³)	50 µg/m³ (state)	ND	ND	ND
	150 µg/m³ (federal)	95.9	130.7	159.0
Number of days exceeding state standard[a]		*ND*	*ND*	*ND*
Number of days exceeding federal standard[a]		*0.0 (0)*	*0.0 (0)*	*1.0 (1)*
Annual concentration (state method) (µg/m³)	20 µg/m³ (state)	ND	ND	ND

Sources: CARB 2021b; EPA 2021b.
Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.
Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
San Lorenzo Valley Middle School Monitoring Station is located at 7179 Hacienda Way, Felton, 95018.
Santa Cruz Monitoring Station is located at 2544 Soquel Avenue, Santa Cruz CA 95060.
Salinas Monitoring Station is located at 855 E Laurel Drive, Salinas, 93901.
Hollister Monitoring Station is located at 1979 Fairview Road, Hollister, 95023.
[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

4.3.2 Regulatory Framework

4.3.2.1 Federal Regulations

Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting NAAQS for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

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

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for HAPs to protect public health and welfare. HAPs include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

4.3.2.2 State Regulations

Criteria Air Pollutants

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

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

California air districts typically based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date when attainment will be achieved in the air basin for the NAAQS or CAAQS. Thresholds established by air districts are protective of human health, as they are based on attainment of the ambient air quality standards, which reflect the maximum pollutant levels in the outdoor air that would not result in harm to the public's health. Table 4.3-3 presents the NAAQS and CAAQS.

Table 4.3-3. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary[c,d]*	*Secondary[c,e]*
O_3	1 hour	0.09 ppm (180 μg/m^3	—	Same as Primary[f]
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)[f]	
NO_2	1 hour	0.18 ppm (339 μg/m^3)	0.100 ppm (137 μg/m^3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2	1 hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)[h]	—
	3 hours	—	—	0.5 ppm (1,300 μg/m^3)
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}	24 hours	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m^3	—	
$PM_{2.5}$	24 hours	—	35 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m^3	12.0 μg/m^3 [i]	15.0 μg/m^3
Lead	30-day Average	1.5 μg/m^3	—	
	Calendar Quarter	—	1.5 μg/m^3 (for certain areas)[k]	
	Rolling 3-Month Average	—	0.15 μg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl Chloride	24 hours	0.01 ppm (26 μg/m^3)[j]	—	—
Sulfates	24 hours	25 μg/m^3	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	

Source: CARB 2016.

Table 4.3-3. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary[c,d]*	*Secondary[c,e]*

Notes: ppm = parts per million by volume; μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter.

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

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

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

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

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

f On October 1, 2015, the primary and secondary NAAQS for O_3 were lowered from 0.075 ppm to 0.070 ppm.

g To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

h On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated non-attainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

i On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

j CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the federal HAPs. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. “High-priority” facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment Program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several airborne toxic control measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR Section 2449 et seq.), In-Use On-Road Diesel-Fueled Vehicles (13 CCR Section 2025), and Limit Diesel-Fueled Commercial Motor Vehicle Idling (13 CCR Section 2485).

California Health and Safety Code Section 41700

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

4.3.2.3 Regional Regulations

Monterey Bay Air Resources District

The MBARD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the Air Basin, where the proposed project is located. The MBARD operates monitoring stations in the Air Basin, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The MBARD’s Air Quality Management Plans (AQMPs) include control measures and strategies to be implemented to attain CAAQS and NAAQS in the Air Basin. The MBARD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Air Quality Management Plan

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the O_3 standard. The California Clean Air Act requires that the AQMP be updated every 3 years. The most recent update is the *2012–2015 Air Quality Management Plan* (2012–2015 AQMP), which was adopted in March 2017, and is an update to the elements included in the 2012 AQMP. The primary elements updated from the 2012 AQMP are the air quality trends analysis, emission inventory, and mobile source programs.

At the time the 2012-2015 AQMP was written, the Air Basin had been a nonattainment area for the CAAQS for both O_3 and PM_{10}.[4] The AQMP addresses only attainment of the O_3 CAAQS. Attainment of the PM_{10} CAAQS is addressed in the MBARD's *2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region* (Particulate Matter Plan), which was adopted in December 2005 and is summarized further below. Maintenance of the 8-hour NAAQS for O_3 is addressed in MBARD's *2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region* (Federal Maintenance Plan), which was adopted in March 2007 and is also summarized below.

The AQMP's emission inventory, a key component of the plan, is an estimate of the amount of ozone precursors emitted into the air each day by man-made (anthropogenic) activities. The inventory represents emissions of ROG and NO_x (tons per day) on a typical weekday during the May through October O_3 season. The inventory includes stationary sources, area-wide sources and mobile sources. Stationary sources include typically large facilities such as power plants or cement plants, while area-wide sources include an aggregate of individually smaller sources, which when grouped together have significant emissions such as consumer products or residential fuel consumption. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the Air Basin, as well as other mobile sources such as off-road agricultural and construction equipment, trains and aircraft (MBARD 2017).

The emissions forecasts consider growth factors, such as population, housing, employment, industrial output, vehicle miles traveled (VMT), etc., developed by state and local agencies, such as Association of Monterey Bay Area Governments (AMBAG). The 2012-2015 AQMP demonstrated how progress had been made toward achieving the O_3 CAAQS between 2006 to 2015 even with some population growth during that same period. Without emission controls, increases in precursor emissions would correspond directly with increases in population. Although the population trend has increased slightly, the number of exceedance days continued to decline during the past 10 years. More stringent and protective emissions standards for automobiles, power plants and other sources of ozone precursors have outpaced population growth with the net result being an improvement in air quality. Specifically, the following list from the 2012-2015 AQMP summarizes some of the key programs and rules that have and will continue to reduce emissions while population increases (MBARD 2017):

- **CARB's Low Emission Vehicle Program** – This program is key to major declines for NO_x and ROG emissions from on-road motor vehicles.

4 The Air Basin is currently designated in attainment of the O_3 CAAQS, and therefore, the MBARD is no longer required to update the AQMP.

- **CARB's Off-Road Motor Vehicle Program** – Similar to the above program, CARB's off-road motor vehicle program is responsible for reductions in NO_x emissions from diesel powered off-road trucks, agricultural equipment and other heavy-duty equipment.
- **CARB's Advanced Clean Cars** – This CARB program promotes new technologies for motor vehicles including low emission and zero emission vehicles as well as clean fuels.
- **District Rule 431, Emissions from Electric Power Boilers** – This rule reduced the MBARD's NO_x inventory by about 20 tons per day due to reductions from the Moss Landing Power Plant. Total NO_x emissions from the plant, including its newer high efficiency gas turbines are less than 2 tons per day.
- **District Rule 1002 Transfer of Gasoline into Vehicle Fuel Tanks** – This rule continues to produce a better than 90% reduction in ROG as well as toxic emissions from the gasoline vapors emitted during refueling of motor vehicles.
- **District Rule 426 Architectural Coatings** — The purpose of this Rule is to limit the emissions of VOCs in the formulation of various architectural coatings.

Of note, the 2012-2015 AQMP indicates that despite a significant overall increase in population of over 152,292 persons within the Air Basin between 2010 and 2035 (21% increase), emissions of NO_x are expected to decrease by over 20 tons per day (44% decrease) in that same time period.

Federal Maintenance Plan

The Federal Maintenance Plan (May 2007) presents the strategy for maintaining the NAAQS for O_3 in the Air Basin. It is an update to an earlier maintenance plan (1994) that was prepared for maintaining the 1-hour NAAQS for O_3 and has since been revoked and superseded by the current 8-hour O_3 standard. Effective June 15, 2004, the EPA designated the Air Basin as an attainment area for the 8-hour NAAQS for O_3. The plan includes an emission inventory for the years 1990 to 2030 for ROG and NO_x, the two primary O_3 precursor gases. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (MBARD 2007).

Particulate Matter Plan

The purpose of the Particulate Matter Plan (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction with local air pollution control districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (MBARD 2005). The Particulate Matter Plan's proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the MBARD's smoke management and emission-reduction incentive programs.

Rules and Regulations

The MBARD establishes and administers a program of rules and regulations to attain and maintain state and national air quality standards and regulations related to TACs. Rules and regulations that may apply to the proposed project include the following:

- **Regulation IV (Prohibitions), Rule 400 (Visible Emissions).** This rule provides limits for visible emissions for sources within the MBARD jurisdiction.
- **Regulation IV (Prohibitions), Rule 402 (Nuisances).** This rule establishes a prohibition against sources creating public nuisances while operating within the MBARD jurisdiction.
- **Regulation IV (Prohibitions), Rule 403 (Particulate Matter).** This rule provides particulate matter emissions limits for sources operating within the MBARD jurisdiction.
- **Regulation IV (Prohibitions), Rule 424 (National Emission Standards for Hazardous Air Pollutions).** This rule is to provide clarity on the MBARD's enforcement authority for the National Emission Standards for Hazardous Air Pollution including asbestos from demolition.
- **Regulation IV (Prohibitions), Rule 425 (Use of Cutback Asphalt).** This rule establishes VOC emissions limits associated with the use of cutback and emulsified asphalts.
- **Regulation IV (Prohibitions), Rule 426 (Architectural Coatings).** This rule establishes VOC emissions limits associated with the use of architectural coatings.

4.3.2.4 Local Regulations

County of Santa Cruz General Plan/Local Coastal Program

California Government Code Section 65302(g) requires the development of Safety Elements. The County of Santa Cruz General Plan/LCP is a comprehensive, long-term planning document for the unincorporated areas of the county and includes the County's LCP, which was certified by the California Coastal Commission in 1994. The County General Plan and LCP provides policies and programs to establish guidelines for future growth and all types of physical developments. In September 2020, the County Board of Supervisors adopted revisions to the General Plan Public Safety Element. The revisions (all except sections related to coastal bluffs and beaches) were approved by the Coastal Commission in February 2022 subject to County acceptance of modifications. Relevant policies are reviewed in Section 4.3.3.3.

Santa Cruz County Code

To minimize conflicts between agricultural lands and non-agricultural uses (such as odors), Santa Cruz County Code (SCCC) section 16.50.095 requires a 200-foot agricultural buffer setback between habitable uses and land designated as an Agricultural Resource Type in the County General Plan/LCP. The buffer is measured from the proposed habitable area and/or habitable structure to the property line of the parcel designated as an Agricultural Resource Type. Agricultural buffer reductions can be approved if features are proposed or present that mitigate potential negative impacts to adjacent or surrounding commercial agricultural land. Existing mitigations can include changes in topography, permanent substantial vegetation, or other physical barriers between the agriculture and non-agricultural uses. Proposed mitigations include the establishment of a physical barrier, typically a 6-foot-tall solid wood fence with a vegetative buffer and the recordation of a Statement of Acknowledgment on the property title which discloses the potential for conflicts between the agricultural and non-agricultural uses.

4.3.3 Impacts and Mitigation Measures

4.3.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to air quality are based on Appendix G of the CEQA Guidelines and, if applicable, other agency standards, as listed below. A significant impact would occur if the project would:

AIR-1 Conflict with or obstruct implementation of the applicable air quality plan.

AIR-2 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

AIR-3 Expose sensitive receptors to substantial pollutant concentrations.

AIR-4 Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The MBARD has established quantitative project-level thresholds of significance for criteria air pollutants of concern for construction and operations (MBARD 2008). However, the MBARD recommends that:

> The air quality analysis of an EIR (Program EIR or otherwise) for a general plan, specific plan, or zoning ordinance should defer any unknown impacts for subsequent EIRs or negative declarations. When comparing the project to an adopted plan or policy, the analysis should examine the existing physical conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced as well as potential future conditions discussed in the existing plan (CEQA Guidelines §15125[e]). The EIR should focus on the project's cumulative air quality impact on regional ozone and its localized impact on carbon monoxide levels. A project's cumulative impact should be analyzed by determining its consistency with the AQMP.... Its localized impact should be assessed by identifying whether build-out would create or substantially contribute to carbon monoxide "hotspots" where federal or state AAQS are exceeded. (MBARD 2008)

As noted above, consistency with the AQMP is used by MBARD to determine a project's cumulative impact on regional air quality (i.e., O_3 levels). Projects that are not consistent with the AQMP have not been accommodated in the AQMP and will have a significant cumulative impact on regional air quality unless emissions are totally offset (MBARD 2008).

For localized CO, the MBARD does not have screening levels for intersection traffic that could result in potential CO hotspots; however, several other air districts have established these levels, which are described below to provide context of the magnitude of hourly volumes that could result in significant localized CO:

- The South Coast Air Quality Management District (SCAQMD) conducted CO modeling for its 2003 Air Quality Management Plan (SCAQMD 2003) for the four worst-case intersections in the South Coast Air Basin. At the time the 2003 AQMP was prepared, the intersection of Wilshire Boulevard and Veteran Avenue was the most congested intersection in Los Angeles County, with an average daily traffic volume of approximately 100,000 vehicles per day. Using CO emission factors for 2002, the peak modeled CO 1-hour concentration was estimated to be 4.6 ppm at the intersection of Wilshire Boulevard and Veteran Avenue. Accordingly, CO concentrations at congested intersections would not exceed the 1-hour or 8-hour CO CAAQS unless projected daily traffic would be at least more than 100,000 vehicles per day.
- The Bay Area Air Quality Management District (BAAQMD) determined that projects would result in a less-than-significant impact to localized CO concentrations if (1) project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour, or (2) project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway) (BAAQMD 2017).

The BAAQMD screening criterion of 24,000 vehicles per hour has been applied to this project as a metric to evaluate CO hotspots. This is a conservative criterion, since vertical and/or horizontal mixing is not limited at the affected intersections proximate to urban areas.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The MBARD recommends an incremental cancer risk threshold of 10 in 1 million. “Incremental cancer risk” is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology. In addition, some TACs have noncarcinogenic effects. The MBARD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects.[5]

4.3.3.2 Analytical Methods

Potential Growth Assumptions

Adoption and implementation of the proposed Sustainability Update would not directly result in impacts related to air quality. However, the proposed General Plan/LCP and SCCC amendments could lead to

[5] Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various noncarcinogens from the Project to published reference exposure levels that can cause adverse health effects.

future development, indirectly resulting in potential impacts related to air quality. The County Design Guidelines component of the proposed project does not include guidelines related to air quality.

Amendments to the General Plan/LCP include policies that support new development, redevelopment, and potential intensified development, primarily within the Urban Services Line (USL), As described in the Section 4.0, Introduction to Analyses, this environmental impact report (EIR) estimates the potential to accommodate approximately 4,500 housing units throughout the county over existing conditions as shown on Table 4.0-2, with approximately 75% projected to occur within urban areas. This EIR also estimates the potential to accommodate approximately 6,210,000 square feet of non-residential uses as shown on Table 4.0-3, with approximately 60% expected to occur within urban areas. These forecasts provide an estimate of potential growth that could occur as a result of adoption and implementation of the proposed Sustainability Update for the purpose of evaluation in this EIR. This estimate of growth may or may not occur, and this estimate does not establish a limit to development. Annual limits for residential units are set annually by the County pursuant to Measure J and SCCC provisions as explained in Section 4.13 of this EIR, Population and Housing. Additionally, some of this projected development and growth would occur under the existing General Plan/LCP without the proposed project.

EIR Notice of Preparation Comments

Public and agency comments were received during the public scoping period in response to the Notice of Preparation (NOP), which is included in Appendix A. A summary of the comments received during the scoping period for this EIR, as well as written comments received, are included in Appendix B. Issues identified in public comments related to potentially significant effects on the environment under the California Environmental Quality Act (CEQA) and issues raised by responsible and trustee agencies are identified and addressed in this EIR. There were no comments related to air quality.

4.3.3.3 Project Impact Analysis

Impact AIR-1: Air Quality Plan Implementation (Significance Threshold AIR-1). Adoption and implementation of the proposed Sustainability Update would not conflict with or obstruct implementation of the appliable air quality plan. (***Less than Significant***)

Adoption and implementation of the proposed Sustainability Update would not obstruct implementation of the region's "Air Quality Management Plan" (AQMP) as the AQMP is independently developed and implemented by the MBARD. However, the State CEQA Guidelines §15125(d) requires that an EIR discuss consistency between a proposed project and applicable regional plans, including the AQMP. The MBARD's "CEQA Guidelines" consider inconsistency with the AQMP to be a significant cumulative adverse air quality impact. The AQMP is prepared to address attainment of the state AAQS and maintenance of the federal O_3 AAQS. The plan accommodates growth by projecting growth in emissions based on different indicators. For example, population forecasts adopted by the AMBAG are used to forecast population-related emissions. Through the planning process, emissions growth is offset by basinwide controls on stationary, area, and transportation sources of air pollution (MBARD

2008). Thus, population-related emissions have been forecast in the AQMP using population forecasts adopted by AMBAG, and population-changing projects which are consistent with these forecasts are consistent with the AQMP. Projects that are not consistent with the AQMP's population projections have not been accommodated in the AQMP and would have a significant cumulative impact on regional air quality unless emissions are totally offset (MBARD 2008).

As indicated above, the proposed project would not directly result in increased dwelling units or population. However, the proposed Sustainability update includes policies that support intensified development in the county's urban areas. For the purpose of the EIR analyses, the County estimates that approximately 4,500 new dwelling units could be constructed as a result of the proposed project, which would bring the total number of housing units in the unincorporated area of the county to 61,827 units in 2040. The current AQMP is based on AMBAG's 2014 Regional Growth Forecast (AMBAG 2014), which only includes projections to year 2035.[6] Based on the 2014 Regional Growth Forecast, housing units in 2035 were projected to total 62,315 units for unincorporated Santa Cruz County. As such, the housing units accommodated by the Sustainability Update for year 2040 would be 488 units *less* than what was assumed in the AQMP for year 2035 for unincorporated Santa Cruz County. Therefore, although adoption and implementation of the proposed project could indirectly result in increased dwelling units and population associated with potential development that would be accommodated by the Sustainability Update, this growth would not conflict with or obstruct implementation of the applicable air quality plan.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact AIR-2: Increase of Criteria Pollutants (Significance Threshold AIR-2). Adoption and implementation of the proposed Sustainability Update would not 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. (***Less than Significant***)

Construction Emissions

Future development accommodated by the proposed plan amendments would result in construction-related emissions that could affect air quality by increasing criteria air pollutant emissions. Construction activities include demolition, excavation, grading, vehicle trips (including workers, deliveries and hauling), and vehicle travel on paved and unpaved surfaces. Vehicle and equipment exhaust would generate pollutant emissions. Construction projects may also generate DPM emissions from diesel-fueled equipment.

The proposed project could indirectly lead to new development that could result in generation of emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement

6 Although AMBAG has adopted the 2018 Regional Growth Forecast, in order to determine consistency with the current AQMP, projects need to compare their housing units to the data incorporated into the AQMP (i.e., AMBAG's 2014 Regional Growth Forecast).

application during construction. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Particulate matter emissions can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, type of equipment in operation, and weather conditions. Internal combustion engines used by construction equipment, vendor trucks (e.g., delivery trucks), and worker vehicles would result in emissions of ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce ROG emissions. Based on MBARD CEQA Guidelines (2008), exhaust emissions from these typical construction activities generally would not result in a significant impact because their emissions are already accounted for in the emissions inventories of the state- and federally required air plans, and they would not have a significant impact on the attainment and maintenance of the O_3 AAQS.

The scale and timing of construction is unknown, and construction activities would be variable throughout the day and overall construction period. The MBARD CEQA Guidelines provide screening levels for potential significant impacts, and projects that are cover 2.2 or more acres may be required to implement dust suppression measures during construction unless future project-level construction-emissions modeling indicates that pollutant thresholds established by the MBARD would not be exceeded. Therefore, implementation and application of MBARD recommended measures, if required, would reduce any future significant project construction emissions to a *less-than-significant level*.

Operational Emissions

Future development and growth accommodated by the Sustainability Update would generate criteria pollutant emissions, including ROG, NO_x, particulate matter, and CO from vehicular traffic, area sources (i.e., consumer products, architectural coatings, landscaping equipment, hearths), and energy sources (i.e., natural gas appliances, space and water heating). The emissions associated with on-road mobile sources include running and starting exhaust emissions, evaporative emissions, brake and tire wear, and fugitive dust entrainment. Agricultural operations are also a potential source of fugitive dust and off-road and on-road vehicle exhaust.

Mobile source emissions would be associated with new vehicle trips. The project (2040) scenario would result in an increase of approximately 93,255 average daily trips and 586,310 VMT, as compared to the Existing (2019) scenario. However, vehicular emission rates are anticipated to lessen in future years due to continuing improvements in automobile and fuel efficiency programs implemented by the State of California. Additionally, as previously indicated in the discussion for Impact AIR-1, the MBARD's latest AQMP forecasts a substantial reduction in emissions through 2035 (i.e., the planning horizon of the AQMP) (MBARD 2017).

For energy sources, future development would be required to comply with the applicable building codes (California Code of Regulations, Title 24, Part 6 and Part 11) at the time of construction. The 2019 Title 24 energy efficiency standards (Part 6) and California Green Building Standards (Part 11) are the current standards. These building codes are reviewed every few years by the Building Standards Commission and California Energy Commission and are revised if necessary. Overtime, it is anticipated that development constructed to more stringent future standards would result in reduced energy consumption (including for natural gas usage) as compared to the current standards, which would result in reduced criteria air pollutants from future buildings as compared to existing buildings.

Although emission rates associated with mobile and energy sources are anticipated to decline in future years, other emissions, such as from wood burning hearths, architectural coatings, brake and tire wear, and re-entrained roadway dust would increase in proportion to the additional development and total VMT from growth accommodated by the Sustainability Update. As summarized in Table 4.3-4, the Sustainability Update includes proposed policy amendments in the Access + Mobility Element of the County's General Plan/LCP that seek to reduce VMT and/or air emissions, such as through the support of zero-emission vehicles and charging infrastructure and alternative transportation options. Depending on the feasibility and level of implementation as applied to individual development projects consistent with the County's General Plan/LCP, the inclusion of additional trip reduction measures would help to further reduce vehicle-related emissions.

Future project-specific compliance with MBARD regulations and permitting would also help to reduce air quality emissions associated with individual projects. In addition, the County will ensure that future CEQA documentation be prepared for individual projects (with project-specific data) that will (if technically possible) mitigate any potential air quality impacts to a less-than-significant level. Overall, however, as discussed in Section 4.3.3.1, pursuant to the MBARD CEQA Guidelines (2008), consistency with the AQMP is the basis to determine the potential cumulative air quality impact of this future development under the project.

As discussed in Impact AIR-1 above, the proposed project could indirectly result in increased housing units and population associated with potential development that would be accommodated by the Sustainability Update. However, this growth would not exceed housing unit estimates in the current AQMP, and thus the project would be consistent with the AQMP. As such, based on the recommended guidance of the MBARD, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable NAAQS or CAAQS. Further, since an AAQS is based on maximum pollutant levels in outdoor air that would not harm the public's health, then a project that is consistent with the AQMP would not result in adverse effects to human health. Based on the preceding considerations, this impact would be *less than significant*.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Table 4.3-4. Proposed and Retained General Plan/LCP Policies that Avoid/Minimize Air Quality Impacts

Potential Impact	Policies and Implementation Strategies
Cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under federal or state ambient air quality standard	• Work with regional and local organization to fund and site new EV charging infrastructure at public facilities, parking lots and new development. (AM-1.1.1g) • Require new development to prioritize bike and ped connections to activity centers. (AM-1.1.4) • Connect neighborhoods-goal of accommodating 15-minute walk or bike ride between residential areas and destinations. (AM-1.1.5) • Support electric and clean air vehicles. (AM-1.1.8) • Require new recreation and visitor-serving development to support alternative transportation, including provision of shuttles, promotion of bicycling and walking to nearby attractions, construction of bus turnouts, bus shelters, and parking spaces for bus and shuttle service. (AM-1.2.1) • Require buffers between people and roadway pollutants. (AM-5.2.5) • Encourage and allow developers to provide multimodal improvements that shift travelers from vehicles to alternative modes to improve level of service and reduce VMT. (AM-6.2.2) • Allow reduction of standard trip generation rates where demonstrated that TDM and other measures/considerations will reduce trips. (AM-6.2.3) • Provide physical access to all recreation facilities through provision of public transportation and/or active transportation (e.g., trails). (PPF-2.1.2) • Require future development projects to implement applicable MBARD control measures and/or air quality mitigations as set forth in the District's "CEQA Guidelines." (Public Safety Policy 6.8.1*) • Prohibit net increase in emissions of non-attainment pollutants or their precursors above the thresholds established by the MBARD from new or modified stationary sources. (Public Safety Policy 6.8.2*) • Require land use projects generating high levels of air pollutants (i.e., manufacturing facilities, hazardous waste handling operations) to incorporate air quality mitigations in their design. (Public Safety Policy 6.8.3*) • Locate air pollution-sensitive land uses away from major sources of air pollution or require mitigation measures to protect residential and sensitive land uses from freeways, arterials, point source polluters, and hazardous material locations. (Public Safety Policy 6.8.5*) • Encourage commercial development and higher density residential development in designated centers or other areas that can be easily served by transit. (Public Safety Policy 6.8.6*)

Table 4.3-4. Proposed and Retained General Plan/LCP Policies that Avoid/Minimize Air Quality Impacts

Potential Impact	Policies and Implementation Strategies
	• Emphasize transit, bicycles and pedestrian modes of transportation rather than automobiles, as well as telecommuting and alternative work schedules. (Public Safety Policy 6.8.7*) • Maintain vegetated and forested areas and encourage cultivation of street trees and yard trees for their contributions to improved air quality. (Public Safety Policy 6.8.8*) • Support and implement local actions and County, State and federal plans and legislation promoting the reduced emission of carbon dioxide and other greenhouse gases, and actions to achieve reduction goals and standards. (Public Safety Policy 6.8.9*) • Support and implement local actions to achieve the most rapid possible international, national, state, and local elimination of the emission of ozone-depleting chemicals. (Public Safety Policy 6.8.10*)

Note: * In September 2020, the County Board of Supervisors adopted revisions to the General Plan Public Safety Element. The revisions (all except sections related to coastal bluffs and beaches) were approved by the Coastal Commission in February 2022 subject to County acceptance of modifications…

Impact AIR-3: Expose Sensitive Receptors (Significance Threshold AIR-3). Adoption and implementation of the proposed Sustainability Update would not expose sensitive receptors to substantial pollutant concentrations. (***Less than Significant***)

Carbon Monoxide Hotspots

Mobile source impacts occur on two scales of motion. Regionally, project-related travel would add to regional trip generation and increase VMT within the local airshed and the Air Basin. Locally, project-generated traffic would be added to the county's roadway system. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. However, because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the Air Basin is steadily decreasing.

The MBARD thresholds of significance for local CO emissions is the 1-hour and 8-hour CAAQS of 20 ppm and 9 ppm, respectively. By definition, these represent levels that are protective of public health. As noted previously, Santa Cruz County is currently designated unclassified/attainment for both state and national CO ambient air quality standards, and the county typically experiences low background CO concentrations.

To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation was conducted comparing the highest hourly traffic volumes at any studied intersection in the county to the 24,000 vehicles-per-hour criterion. Based on traffic conditions considered for development of the proposed project and described in Section 4.15, Transportation, of the EIR, the maximum hourly volume under the project (2040) scenario is approximately 4,600 vehicles at the intersection of Capitola Road and Soquel Avenue in the PM peak hour, which would be substantially less than the screening criterion applied. Therefore, the development accommodated by the Sustainability Update would not significantly contribute to a CO hotspot, and this impact would be *less than significant without mitigation*.

Toxic Air Contaminants

In addition to impacts from criteria pollutants, impacts from development accommodated by the Sustainability Update may include emissions of pollutants identified by the state and federal government as TACs or HAPs. The greatest potential for TAC emissions during construction would be DPM emissions from heavy equipment operations and heavy-duty trucks. DPM has established cancer risk factors and relative exposure values for long-term chronic health hazard impacts; however, no short-term, acute relative exposure level has been established for DPM. The potential for development of any individual project to result in a significant health risk at nearby sensitive receptors is dependent on many variables including, but not limited to, the total amount of DPM emissions generated during construction, the duration of construction and thereby exposure period, the proximity to nearby sensitive receptors, the predominant wind direction and other meteorological factors, and topography. Due to the unknown location of future development accommodated by the Sustainability Update, including the levels of potential TAC emissions in relation to the location of sensitive receptors, the potential associated health risk (including cancer risk and chronic hazard index) cannot be estimated with a level of accuracy. Further, short-term construction activities do not lend themselves to analysis of long-term health risks because of their temporary and variable nature, as described in the following (BAAQMD 2017):

> Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70% at a distance of approximately 500 feet. In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk.

Therefore, project-level analyses of construction activities tend to produce overestimated assessments of long-term health risks. DPM has established cancer risk factors and relative exposure values for long-term chronic health hazard impacts; however, no short-term, acute relative exposure level has been established for DPM. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a long-term (i.e., 9-, 30-, or 70-year) exposure period will contract cancer based on the use of the current Office of Environmental Health Hazard Assessment's risk-assessment methodology (OEHHA 2015). In addition, any operation of heavy-duty diesel construction equipment is subject to CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce DPM emissions, and any operation of diesel trucks are also subject to a CARB Airborne Toxics Control Measure. Finally, future development accommodated by the Sustainability Update would be subject to future discretionary permits and CEQA evaluation. Therefore, the potential for the project to indirectly generate construction-related TAC emissions and associated health risk is considered *less than significant.*

Furthermore, in addition to existing air quality protection policies, the Sustainability Update includes a number of amended policies in the Access + Mobility (AM) Element of the County's General Plan/LCP that seek to reduce VMT and/or air emissions as summarized in Table 4.3-4, which is consistent with the goals of the MBARD's AQMP.

To address long-term operations, CARB has published the Air Quality and Land Use Handbook: A Community Health Perspective (CARB 2005), which identifies certain types of facilities or sources that may emit substantial quantities of TACs and therefore could conflict with sensitive land uses, such as "schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities." The Air Quality and Land Use Handbook is a guide for siting of new sensitive land uses, but it does not mandate specific separation distances to avoid potential health impacts. Table 4.3-5 shows a summary of CARB recommendations for siting new sensitive land uses within the vicinity of air-pollutant-generating sources. Recommendations in Table 4.3-5 are based on data that show that localized air pollution exposures can be reduced by as much as 80% by following CARB minimum distance separations.

CARB's siting recommendations were based on a compilation of studies that evaluated data on the adverse health effects ensuing from proximity to air pollution sources. The key observation in these studies is that proximity to air pollution sources substantially increases both exposure and the potential for adverse health effects. There are three carcinogenic TACs that constitute the majority of the known health risks from motor vehicle traffic: DPM from trucks and benzene and 1,3 butadiene from passenger vehicles.

Based on the nature of the project, it is not anticipated that stationary sources of TAC emissions would be common. However, if a stationary source of TAC emissions is proposed, such as an emergency generator, the appropriate permits from the MBARD would be required, which would include preparation of a health risk assessment and, if necessary, TAC control measures to ensure potential health risk impacts would not occur.

Additionally, existing Public Safety Element policies (6.8.1, 6.8.3, and 6.8.5) require future development projects to implement applicable MBARD control measures and/or air quality mitigations in the design of new projects as set forth in the District's "CEQA Guidelines. Compliance with these policies, as well as project-specific environmental review that would be required under CEQA, would ensure that any TACs emitted by new development would be assessed and minimized, and sensitive receptors would be located away from major sources of air pollution. Based on the preceding considerations, the potential for development accommodated by the Sustainability Update to result in exposure of sensitive receptors to substantial pollutant concentrations and associated health risk is considered *less than significant*.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Table 4.3-5. CARB Recommendations for Siting New Sensitive Land Uses

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day.
Distribution Centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). Take into account the configuration of existing distribution centers and avoid locating residences and other sensitive land uses near entry and exit points.
Rail Yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within 1 mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks.
Refineries	Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry-cleaning operation. For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult with the local air district. Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

Source: CARB 2005.

Impact AIR-4: Other Emissions-Odors (Significance Threshold AIR-4). Adoption and implementation of the proposed Sustainability Update would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. (***Less than Significant***)

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of the receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Future development occurring as a result of the proposed Sustainability Update would generate odors from vehicles and/or equipment exhaust emissions during construction. Odors produced would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly and would generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors from construction would be considered less than significant.

According to the MBARD, objectionable odors include sulfur compounds and methane, and typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries (MBARD 2008). Due to the unknown location of future development accommodated by the Sustainability Update, it is not known whether uses would result in adverse odors. The proposed Sustainability Update does not specifically identify, designate, or support any new uses that would be considered likely significant odor-generating facilities. However, agricultural uses will continue under the proposed General Plan/LCP in proximity to urbanized uses. Existing and proposed General Plan/LCP policies and Santa Cruz County Code regulations require a 200-foot buffer between agricultural uses and residential uses as well as signing a notification acknowledging the presence of agricultural operations that can include odors and other nuisances. See Section 4.2.3 for further discussion. Therefore, sensitive receptors near agricultural operations would not be exposed to substantial, potentially significant impacts related to odor. Finally, approval of the Sustainability Update itself, as a policy document update, does not provide any goals, policies, or programs that would indirectly lead to a significant increase odors. Therefore, the odor impacts would be *less than significant*.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

4.3.3.4 Cumulative Impact Analysis

As discussed previously, air pollution by nature is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and the MBARD develops and implements plans for future attainment of ambient air quality standards. The potential for the project to result in a cumulatively considerable impact, specifically a cumulatively considerable new increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS and/or CAAQS, is addressed in Impact AIR-2.

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