4.2 AIR QUALITY

This section describes the existing environmental baseline for air quality relevant to the proposed project and alternatives, including a description of regional topography and climate. In addition, this section outlines applicable Federal, State, and local air quality regulatory requirements, local and regional air quality pollutants, existing conditions, ambient air quality standards (AAQS), and sensitive receptors. This section is based on the air quality analysis of the proposed project prepared by Ambient Air Quality and Noise Consulting (Ambient, 2016) and contained in **Appendix D**. The Monterey Bay Unified Air Pollution Control District (MBUAPCD or District) is the regional agency tasked with managing air quality in the region, which is overseen by the California Air Resources Board (ARB). The MBUAPCD has published CEQA Air Quality Guidelines that also are used in this assessment to evaluate air quality impacts of projects (MBUAPCD, 2008).

Public and agency comments were received during the public scoping period. To the extent that issues identified in public comments involve potentially significant effects on the environment according to the CEQA and/or are raised by responsible agencies, they are identified and addressed within this EIR. No comments concerning air quality were received. For a complete list of public comments received during the public scoping period, refer to **Appendix A**, **NOP and Public Comment Letters**.

4.2.1 Environmental Setting

4.2.1.1 Regional Overview

The proposed project is located within the North Central Coast Air Basin (NCCAB), one of fourteen (14) statewide basins designated by the ARB. The NCCAB covers an area of 5,159 square miles along the central California coast. The NCCAB is comprised of Monterey, Santa Cruz, and San Benito Counties. The MBUAPCD is responsible for local control and monitoring of criteria air pollutants throughout the NCCAB. Air quality is affected by topography, meteorology, and climate. These factors are discussed in more detail in the following sections.

4.2.1.2 Topography

The NCCAB covers an area of 5,159 square miles along the central coast and encompasses Santa Cruz, San Benito, and Monterey counties. The NCCAB is generally bounded by the Diablo Range to the northeast, which together with the southern portion of the Santa Cruz Mountains forms the Santa Clara Valley which extends into the northeastern tip of the NCCAB. Farther south, the Santa Clara Valley transitions into the San Benito Valley, which runs northwest-southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range, is the Salinas Valley that extends from Salinas at the northwest end to King City at the southeast end. The northwest portion of the NCCAB is dominated by the Santa Cruz Mountains.

4.2.1.3 Meteorology and Climate

Climate, or the average weather condition, affects air quality in several ways. Wind patterns can remove or add air pollutants emitted by stationary or mobile sources. Inversion, a condition where warm air traps cooler air underneath it, can hold pollutants near the ground by limiting upward mixing (dilution). Communities with cold climates may burn wood or other fuels for residential heating,

whereas areas with hot climates may have higher emissions of some pollutants from automobiles. Topography also plays a part, as valleys often trap emissions by limiting lateral dispersal.

In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. As air descends in the Pacific high pressure cell, a stable temperature inversion is formed. As temperatures increase, the warmer air aloft expands, forcing the coastal layer of air to move onshore producing a moderate sea breeze over the coastal plains and valleys. Temperature inversions inhibit vertical air movement and often result in increased transport of air pollutants to inland receptor areas. The on-shore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air acts as a lid to inhibit vertical air movement. The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure that intensifies the onshore air flow during the afternoon and evening. Summer temperatures generally remain between 40 and 70 degrees along the coastal areas. In the fall, the surface winds weaken, 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 NCCAB.

In the winter, when the high pressure cell is weakest and farthest south, the inversion associated with the Pacific high pressure cell is typically absent in the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys in the NCCAB. The predominant offshore flow during this time of year tends to aid in pollutant dispersal producing relatively healthful to moderate air quality throughout the majority of the region. Conditions during this time are often characterized by afternoon and evening land breezes and occasional rain storms. However, local inversions caused by the cooling of air close to the ground can form in some areas during the evening and early morning hours.

Winter daytime temperatures in the NCCAB typically average in the mid-50s during the day, with nighttime temperatures averaging in the low-40s. Summer daytime temperatures typically average in the 60s during the day, with nighttime temperatures averaging in the 50s. Precipitation varies within the region, but in general, annual rainfall is lowest in the coastal plain and inland valley, higher in the foothills, and highest in the mountains.

4.2.1.4 Criteria Air Pollutants & Ambient Air Quality Standards

The Federal Clean Air Act (FCAA) requires that the United States Environmental Protection Agency (EPA) establish National Ambient Air Quality Standards (NAAQS) for various pollutants. These pollutants are referred to as "criteria" pollutants because the EPA publishes criteria documents to justify the choice of standards. NAAQS define the maximum amount of an air pollutant that can be present in ambient air. An AAQS is generally specified as a concentration averaged over a specific time period, such as 1-hour, 8-hours, 24-hours, or 1-year. The different averaging times and concentrations are meant to protect against different exposure effects. AAQS established for the protection of human health are referred to as primary standards; whereas, standards established for the prevention of environmental and property damage are called secondary standards. The FCAA allows States to adopt additional or more health-protective standards.

The following provides a summary discussion of the primary and secondary criteria air pollutants of primary concern. In general, primary pollutants are directly emitted into the atmosphere, and

secondary pollutants are formed by chemical reactions in the atmosphere. **Table 4.2-1** identifies the applicable criteria air pollutant and their corresponding AAQS.

- **Ozone (O_3)** is a reactive gas consisting of three atoms of oxygen. In the troposphere, it is a product of the photochemical process involving the sun's energy. It is a secondary pollutant that is formed when NO_X and volatile organic compounds (VOC), also referred to as reactive organic gases (ROG) react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects and is a criteria pollutant. It is a major component of smog. In the stratosphere, O_3 exists naturally and shields Earth from harmful incoming ultraviolet radiation.

  High concentrations of ground level O_3 can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments. Ozone also damages natural ecosystems such as forests and foothill communities, agricultural crops, and some man-made materials, such as rubber, paint, and plastics.

- **Reactive Organic Gas (ROG)** is a reactive chemical gas, composed of hydrocarbon compounds that may contribute to the formation of smog by their involvement in atmospheric chemical reactions. No separate health standards exist for ROG as a group. Because some compounds that make up ROG are also toxic, like the carcinogen benzene, they are often evaluated as part of a toxic risk assessment. Total Organic Gases (TOG) includes all of the ROGs, in addition to low reactivity organic compounds like methane and acetone. ROGs and VOC are subsets of TOG.

- **Volatile Organic Compounds (VOC)** are hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and may also be toxic. VOC emissions are a major precursor to the formation of O_3. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints.

- **Oxides of Nitrogen (NO_X)** are a family of gaseous nitrogen compounds and is a precursor to the formation of O_3 and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2), is a reddish-brown gas that is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

- **Particulate Matter (PM)**, also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates [SO_4^{2-}]), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. EPA groups particle pollution into three categories based on their size and where they are deposited:

Table 4.2-1. Summary of Ambient Air Quality Standards (AAQS)

Pollutant	Averaging Time	California Standards*	National Standards* (Primary)
Key to Acronyms and Units: *AAM – Annual Arithmetic Mean; µg/m^3 – micrograms per cubic meter; ppb – parts per billion; ppm – parts per million*			
Ozone (O_3)	1-hour	0.09 ppm	–
	8-hour	0.070 ppm	0.070 ppm
Inhalable Particulate Matter (PM_{10})	AAM	20 µg/m^3	–
	24-hour	50 µg/m^3	150 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	12 µg/m^3
	24-hour	No Standard	35 µg/m^3
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9 ppm	9 ppm
	8-hour (Lake Tahoe)	6 ppm	–
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	0.053 ppm
	1-hour	0.18 ppm	100 ppb
Sulfur Dioxide (SO_2)	AAM	–	0.03 ppm (for certain areas)
	24-hour	0.04 ppm	0.14 ppm (for certain areas)
	3-hour	–	0.5 ppm (1300 µg/m^3)**
	1-hour	0.25 ppm	75 ppb
Lead (Pb)	30-day Average	1.5 µg/m^3	–
	Calendar Quarter	–	1.5 µg/m^3 (for certain areas)
	Rolling 3-Month Average	–	0.15 µg/m^3
Sulfates (SO_4^{2-})	24-hour	25 µg/m^3	No Federal Standards
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 µg/m^3)	
Vinyl Chloride (C_2H_3Cl or VCM)	24-hour	0.01 ppm (26 µg/m^3)	
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer-visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative	

Pollutant	Averaging Time	California Standards*	National Standards* (Primary)
		humidity is less than 70 percent.	

** For more information on standards visit: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf*
***Secondary Standard*
Source: ARB, 2016

- "Inhalable coarse particles ($PM_{2.5-10}$)," such as those found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- "Fine particles ($PM_{2.5}$)," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.
- "Ultrafine particles (UFP)," are very small particles less than 0.1 micrometers in diameter largely resulting from the combustion of fossils fuels, meat, wood and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, its high surface area, deep lung penetration, and transfer into the bloodstream can result in disproportionate health impacts relative to their mass.

Inhalable particulate matter (PM_{10})[1], $PM_{2.5}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors). Generally speaking, $PM_{2.5}$ and UFP are emitted by combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include these same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent a source of airborne dust.

Numerous scientific studies have linked both long- and short-term particle pollution exposure to a variety of health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and also acute (short-term) bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short term exposures, although they may experience temporary minor irritation when particle levels are elevated.

- **Carbon Monoxide (CO)** is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air (unlike O_3). The main source of CO is on-road motor vehicles. Other CO sources include other mobile sources, miscellaneous processes, and fuel combustion from stationary sources. Because of the local nature of CO problems, ARB and U.S. EPA designate urban areas as CO nonattainment areas instead of the entire basin as with O_3 and PM_{10}. Motor vehicles are by far the largest source of CO emissions.

[1] PM_{10} are inhalable PM, equal to or less than 10 micrometers in diameter.

Emissions from motor vehicles have been declining since 1985, despite increases in vehicle miles traveled, with the introduction of new automotive emission controls and fleet turnover.

- **Sulfur Dioxide (SO_2)** is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. However, like airborne NO_X, suspended sulfur oxides (SO_X) particles contribute to the poor visibility. These SO_X particles can also combine with other pollutants to form $PM_{2.5}$. The prevalence of low-sulfur fuel use has minimized problems from this pollutant.
- **Lead (Pb)** is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead can also cause lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically.

OTHER POLLUTANTS

The State of California has established air quality standards (CAAQS) for some pollutants not addressed by NAAQS. The ARB has established CAAQS for H_2S, SO_4^{2-}, VCM, and visibility reducing particles (see **Table 4.2-1** above). The following section summarizes these pollutants and provides a description of the pollutants' physical properties, health and other effects, sources, and the extent of the problems.

- **Hydrogen Sulfide (H_2S)** is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide is extremely hazardous in high concentrations; especially in enclosed spaces (800 parts per million [ppm] can cause death). Occupational Safety and Health Administration (OSHA) regulates workplace exposure to H_2S.
- **Sulfates (SO_4^{2-})** are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to SO_4^{2-} takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

  The SO_4^{2-} CAAQS is designed to prevent aggravation of respiratory symptoms. Effects of SO_4^{2-} exposure at levels above the standard include a decrease in ventilator function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property.
- **Visibility Reducing Particles** are a mixture of suspended particulate matter consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
- **Vinyl Chloride (C_2H_3Cl or VCM)** is a colorless gas that does not occur naturally. It is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down. VCM is used to make polyvinyl chloride which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

4.2.1.5 Odors

Typically odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from the psychological (i.e., irritation, anger, or anxiety) to the physiological, including circulatory and respiratory effects, nausea, vomiting, and headache.

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor and in fact an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note, that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Neither the State nor the Federal governments have adopted rules or regulations for the control of odor sources. The MBUAPCD does not have an individual rule or regulation that specifically addresses odors; however, odors would be subject to MBUAPCD *Rule 402, Nuisance*. Any actions related to odors would be based on citizen complaints to local governments and the MBUAPCD.

4.2.1.6 Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air, but due to their high toxicity, they may pose a threat to public health even at very low concentrations. Because there is no threshold level below which adverse health impacts are not expected to occur, TACs differ from criteria pollutants for which acceptable levels of exposure can be determined and for which State and Federal governments have set AAQS. TACs, therefore, are not considered "criteria pollutants" under either the FCAA or the California Clean Air Act (CCAA), and are thus not subject to NAAQS and CAAQS. Instead, the EPA and the ARB regulate Hazardous Air Pollutants (HAPs) and TACs through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with MBUAPCD rules, these Federal and State statutes and regulations establish the regulatory framework for TACs. At the national levels, the EPA has established National Emission Standards for HAPs (NESHAPs), in accordance with the requirements of the FCAA and subsequent amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

Within California, TACs are regulated primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. The following provides a summary of the primary TACs of concern within the State of California and related health effects.

- **Diesel Exhaust Particulate Matter (Diesel Exhaust PM or DPM)** was identified as a TAC by the ARB in August 1998. DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities (ARB, 2013).

  In October 2000, the ARB issued a report entitled: "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles," which is commonly referred to as the Diesel Risk Reduction Plan (DRRP) (ARB, 2000). The DRRP provides a mechanism for combating the DPM problem. The goal of the DRRP is to reduce concentrations of DPM by 85 percent by the year 2020, in comparison to year 2000 baseline emissions. The key elements of the DRRP are to clean up existing engines through engine retrofit emission control devices, to adopt stringent standards for new diesel engines, and to lower the sulfur content of diesel fuel to protect new, and very effective, advanced technology emission control devices on diesel engines. When fully implemented, the DRPP will significantly reduce emissions from both old and new diesel fueled motor vehicles and from stationary sources that burn diesel fuel. In addition to these strategies, the ARB continues to promote the use of alternative fuels and electrification. As a result of these actions, DPM concentrations and associated health risks in future years are projected to decline (ARB, 2013).

  Exposure to DPM can have immediate health effects. DPM can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, DPM has been identified as a carcinogen.

- **Acetaldehyde** is a Federal HAP. The ARB identified acetaldehyde as a TAC in April 1993. Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Sources of acetaldehyde include emissions from combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. A majority of the statewide acetaldehyde emissions can be attributed to mobile sources, including on-road motor vehicles, construction and mining equipment, aircraft, recreational boats, and agricultural equipment. Area sources of emissions include the burning of wood in residential fireplaces and wood stoves. The primary stationary sources of acetaldehyde are from fuel combustion from the petroleum industry (ARB, 2013).

Acute exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic intoxication of acetaldehyde resemble those of alcoholism. The EPA has classified acetaldehyde as a probable human carcinogen. In California, acetaldehyde was classified on April 1, 1988, as a chemical known to the State to cause cancer (EPA, 2014; ARB, 2013).

- **Benzene** is highly carcinogenic and occurs throughout California. The ARB identified benzene as a TAC in January 1985. A majority of benzene emitted in California (roughly 88 percent) comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. These sources include on-road motor vehicles, recreational boats, off-road recreational vehicles, and lawn and garden equipment. Benzene is also formed as a partial combustion product of larger aromatic fuel components. To a lesser extent, industry-related stationary sources are also sources of benzene emissions. The primary stationary sources of reported benzene emissions are crude petroleum and natural gas mining, petroleum refining, and electric generation that involves the use of petroleum products. The primary area sources include residential combustion of various types, such as cooking and water heating (ARB, 2013).

  Acute inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidences of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. The EPA has classified benzene as known human carcinogen for all routes of exposure (EPA, 2014).

- **1,3-butadiene** was identified by the ARB as a TAC in 1992 (ARB, 1992). Most of the emissions of 1,3-butadiene are from incomplete combustion of gasoline and diesel fuels. Mobile sources account for a majority of the total statewide emissions. Additional sources include agricultural waste burning, open burning associated with forest management, petroleum refining, manufacturing of synthetics and man-made materials, and oil and gas extraction. The primary natural sources of 1,3-butadiene emissions are wildfires (ARB, 2013).

  Acute exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Epidemiological studies have reported a possible association between 1,3-butadiene exposure and cardiovascular diseases. Epidemiological studies of workers in rubber plants have shown an association between 1,3-butadiene exposure and increased incidence of leukemia. Animal studies have reported tumors at various sites from 1,3-butadiene exposure. In California, 1,3-butadiene has been identified as a carcinogen.

- **Carbon Tetrachloride** was identified by the ARB as a TAC in 1987 under California's TAC program (ARB, 2013). The primary stationary sources reporting emissions of carbon tetrachloride include chemical and allied product manufacturers and petroleum refineries. In the past, carbon tetrachloride was used for dry cleaning and as a grain-fumigant. Usage for these purposes is no longer allowed in the United States. Carbon tetrachloride has not been registered for pesticidal use in California since 1987. Also, the use of carbon tetrachloride in products to be used indoors has been discontinued in the United States. The statewide emissions of carbon tetrachloride are small (about 1.96 tons per year), and background concentrations account for most of the health risk (ARB, 2013).

The primary effects of carbon tetrachloride in humans are on the liver, kidneys, and central nervous system. Human symptoms of acute inhalation and oral exposures to carbon tetrachloride include headache, weakness, lethargy, nausea, and vomiting. Acute exposures to higher levels and chronic (long-term) inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans. Human data on the carcinogenic effects of carbon tetrachloride are limited. Studies in animals have shown that ingestion of carbon tetrachloride increases the risk of liver cancer. In California, carbon tetrachloride has been identified as a carcinogen.

- **Hexavalent chromium** was identified as a TAC in 1986. Sources of Hexavalent chromium include industrial metal finishing processes, such as chrome plating and chromic acid anodizing, and firebrick lining of glass furnaces. Other sources include mobile sources, including gasoline motor vehicles, trains, and ships (ARB, 2013).

  The respiratory tract is the major target organ for hexavalent chromium toxicity, for acute and chronic inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to hexavalent chromium, while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure. Human studies have clearly established that inhaled hexavalent chromium is a human carcinogen, resulting in an increased risk of lung cancer. In California, hexavalent chromium has been identified as a carcinogen.

- **Para-Dichlorobenzene** was identified by the ARB as a TAC in April 1993. The primary area-wide sources that have reported emissions of para-dichlorobenzene include consumer products such as non-aerosol insect repellants and solid/gel air fresheners. These sources contribute nearly all of the statewide para-dichlorobenzene emissions (ARB, 2013).

  Acute exposure to paradichlorobenzene via inhalation results in irritation to the eyes, skin, and throat in humans. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans. The EPA has classified para-dichlorobenzene as a possible human carcinogen.

- **Formaldehyde** was identified by the ARB as a TAC in 1992 (ARB, 1992). Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Photochemical oxidation is the largest source of formaldehyde concentrations in California ambient air. Directly emitted formaldehyde is a product of incomplete combustion. One of the primary sources of directly-emitted formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is also used in fumigants and soil disinfectants. The primary area sources of formaldehyde emissions include wood burning in residential fireplaces and wood stoves (ARB, 2013).

  Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute and chronic inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. Formaldehyde is classified as a probable human carcinogen.

- **Methylene Chloride** was identified by the ARB as a TAC in 1987. Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic

fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the main ingredient in many paint stripping formulations. Plastic product manufacturers, manufacturers of synthetics, and aircraft and parts manufacturers are stationary sources reporting emissions of methylene chloride (ARB, 2013).

The acute effects of methylene chloride inhalation in humans consist mainly of nervous system effects including decreased visual, auditory, and motor functions, but these effects are reversible once exposure ceases. The effects of chronic exposure to methylene chloride suggest that the central nervous system is a potential target in humans and animals. Human data are inconclusive regarding methylene chloride and cancer. Animal studies have shown increases in liver and lung cancer and benign mammary gland tumors following the inhalation of methylene chloride. In California, methylene chloride has been identified as a carcinogen.

- **Perchloroethylene** was identified by the ARB as a TAC in 1991. Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In California, the stationary sources that have reported emissions of perchloroethylene are dry cleaning plants, aircraft part and equipment manufacturers, and fabricated metal product manufacturers. The primary area sources include consumer products such as automotive brake cleaners and tire sealants and inflators (ARB, 2013).

  Acute inhalation exposure to perchloroethylene vapors can result in irritation of the upper respiratory tract and eyes, kidney dysfunction, and at lower concentrations, neurological effects, such as reversible mood and behavioral changes, impairment of coordination, dizziness, headaches, sleepiness, and unconsciousness. Chronic inhalation exposure can result in neurological effects, including sensory symptoms such as headaches, impairments in cognitive and motor neurobehavioral functioning, and color vision decrements. Cardiac arrhythmia, liver damage, and possible kidney damage may also occur. In California, perchloroethylene has been identified as a carcinogen.

4.2.1.7 Attainment Status

The attainment status of the NCCAB is summarized in **Table 4.2-2.** An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A nonattainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation(s) was caused by an exceptional event, as defined in the criteria. Unclassified designations indicate insufficient data is available to determine attainment status. Under the CCAA, the basin is designated as a nonattainment transitional area for the O_3 CAAQS. The NCCAB is also designated a nonattainment area for the PM_{10} CAAQS. Under the FCAA, the NCCAB is currently designated attainment for the recently established eight-hour O_3 NAAQS. The NCCAB is designated either attainment or unclassified for the remaining CAAQS and NAAQS.

Table 4.2-2. NCCAB Attainment Status Designations

Pollutant	State Designation [1]	National Designation
Ozone (O_3)	Nonattainment [2]	Attainment/Unclassified[3]
Inhalable Particulate Matter (PM_{10})	Nonattainment	Attainment
Fine Particulate Matter ($PM_{2.5}$)	Attainment	Unclassified/Attainment [4]
Carbon Monoxide (CO)	Monterey County-Attainment San Benito County-Unclassified Santa Cruz County-Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified[5]
Sulfur Dioxide (SO_2)	Attainment	Attainment[6]
Lead (Pb)	Attainment	Unclassified/Attainment[7]

Notes:

1. *State designations based on 2010 to 2012 air monitoring data.*
2. *Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the State O_3 standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.*
3. *On March 12, 2008, EPA adopted a new 8-hour O_3 standard of 0.075 ppm. In April 2012, EPA designated the NCCAB attainment/unclassified based on 2009-2011 data.*
4. *This includes the 2006 24-hour standard of 35 µg/m^3 and the 2012 annual standard of 12 µg/m^3.*
5. *In 2012, EPA designated the entire State as attainment/unclassified for the 2010 NO_2 standard.*
6. *In June 2011, the ARB recommended to EPA that the entire State be designated as attainment for the 2010 primary SO_2 standard. Final designations to be addressed in future EPA actions.*
7. *On October 15, 2008 EPA lowered the NAAQS for lead to 0.15 µg/m^3. Final designations were made by EPA in November 2011.*

Source: MBUAPCD, 2015.

4.2.1.8 Air Quality Monitoring Data

Air quality in the region is controlled by the rate of pollutant emissions and meteorological conditions. Meteorological conditions such as wind speed, atmospheric stability, and mixing height may all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while frequent, short-term variations result from changes in atmospheric conditions. Air pollutant concentrations are measured at several monitoring stations in Monterey County. The "Salinas #3 Monitoring Station" is the closest representative monitoring site to the proposed project with sufficient data to meet EPA and/or ARB criteria for quality assurance. This monitoring station monitors ambient concentrations of O_3, NO_2, CO, and $PM_{2.5}$. Ambient monitoring data was obtained for the last three years of available measurement data (i.e., 2012 through 2014) and are summarized in **Table 4.2-3**. As depicted, NAAQS and CAAQS for O_3, NO_2, CO, and $PM_{2.5}$ have not been exceeded during the past three years.

Table 4.2-3. Summary of Ambient Air Quality Monitoring Data[1]

	2012	2013	2014
Ozone (O_3)			
Maximum concentration, ppm (1-hour/8-hour average)	0.071/0.055	0.065/0.062	0.066/0.062
Number of days State/national 1-hour standard exceeded	0/0	0/0	0/0
Number of days State/national 8-hour standard exceeded	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)			
Maximum concentration, ppm (1-hour average)	42.0	42.0	38.0
Annual average	5	5	5
Number of days State standard exceeded	0	0	0
Carbon Monoxide (CO)			
Maximum concentration, ppm (1-hour/8-hour average)	1.6/1.39	1.7/1.2	1.8/1.1
Number of days State/national 1-hour standard exceeded	0	0	0
Number of days State/national 8-hour standard exceeded	0	0	0
Suspended Particulate Matter ($PM_{2.5}$)			
Maximum concentration, µg/m^3 (State/national)	16.2	19.7	20.2
Number of days national standard exceeded (measured/calculated[2])	0/0	0/0	0/0

ppm = parts per million by volume, µg/m^3 = micrograms per cubic meter

1. *Ambient data was obtained from the Salinas #3 Monitoring Station.*
2. *Measured days are those days that an actual measurement was greater than the standard. Calculated days are the number of days that a measurement would have been greater than the standard had measurements been collected every day.*

Source: ARB, 2015; EPA, 2015

4.2.1.9 Sensitive Receptors

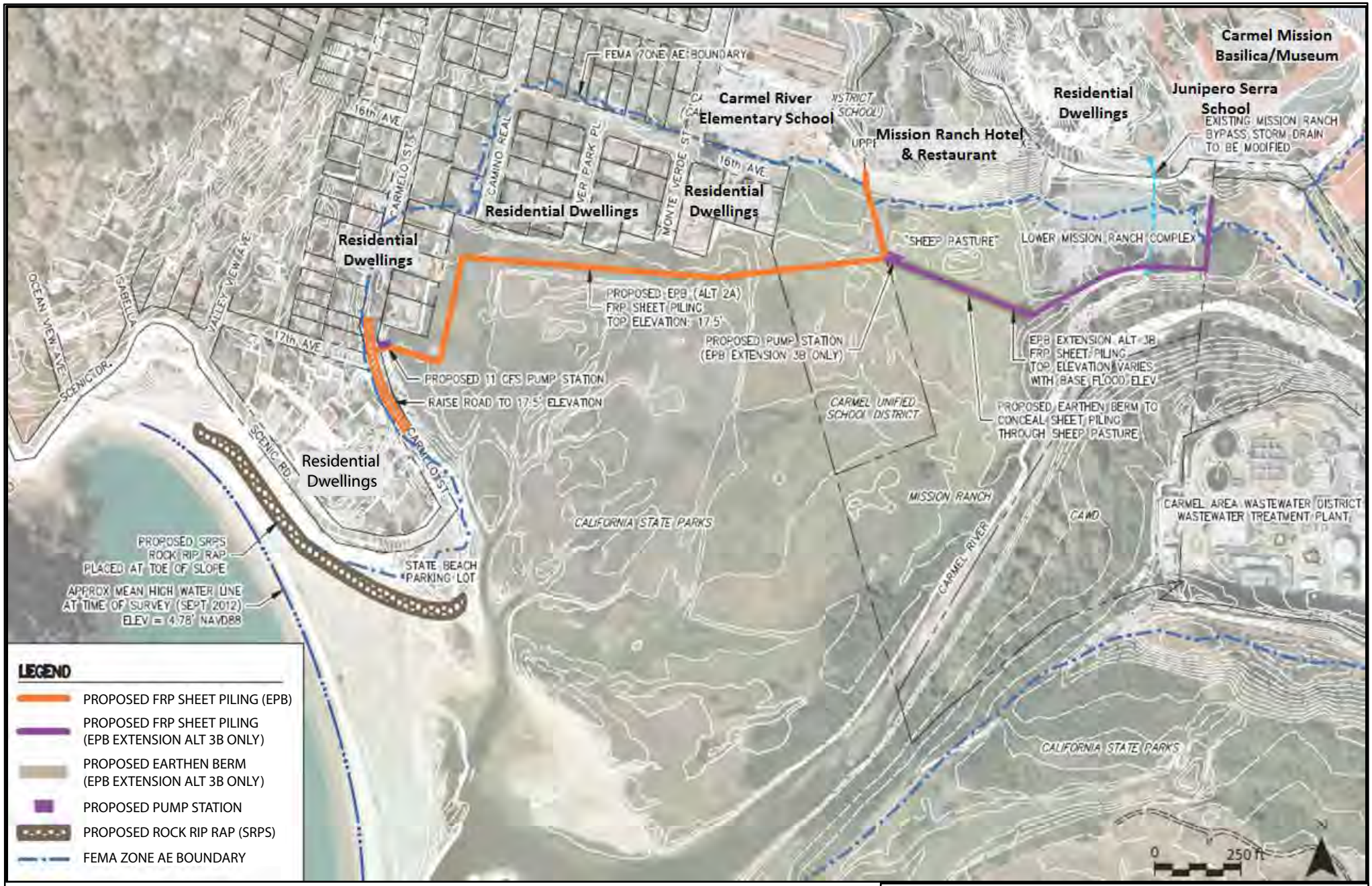
One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed "sensitive receptors." The term sensitive receptors refer to specific population groups, as well as the land uses where individuals would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses would include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Residential dwellings, schools, parks, playgrounds, childcare centers, convalescent homes, and hospitals are examples of sensitive land uses.

The nearest sensitive receptors consist predominantly of residential dwellings, the nearest of which are generally located adjacent to and north of the proposed project area. Carmel River Elementary School and the Mission Ranch Hotel are located adjacent to and north of the proposed project site, south of 14th Avenue. In addition, Junipero Serra School and the Carmel Mission Basilica/Museum are also located north of the proposed project site, east of Dolores Street. The nearest land uses are depicted in **Figure 4.2-1**.

4.2.2 Regulatory Environment

Air quality within the NCCAB is regulated by several jurisdictions including the EPA, ARB, and the MBUAPCD. Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation. Although EPA regulations may not be superseded, both State and local regulations may be more stringent.

This Page Intentionally Left Blank



Proposed Project Component Summary Map and Nearby Land Uses

Sources: AMBIENT Air Quality & Noise Consulting, 2016; Denise Duffy & Associates, Inc. 2015; Whitson Engineers, 2015

Denise Duffy and Associates, Inc.
Planning and Environmental Consulting

Date 3-10-16

Scale

Figure 4.2-1

This Page Intentionally Left Blank

4.2.2.1 Federal

U.S. ENVIRONMENTAL PROTECTION AGENCY/FEDERAL CLEAN AIR ACT

The FCAA of 1970, as amended, authorized the establishment of NAAQS and set deadlines for their attainment. The FCAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and attainment, and incorporates sanctions for the failure to meet interim milestones. The EPA is the Federal agency charged with administering FCAA and other air quality-related legislation.

NAAQS are established for six "criteria" air pollutants: CO, NO_x, O_3, PM (PM_{10} and $PM_{2.5}$), SO_x, and Pb. The EPA is responsible for developing rules and regulations to preserve and improve air quality and delegates specific responsibilities to State and local agencies. Pursuant to the FCAA, the State of California has also established CAAQS. The CAAQS are generally more stringent than the corresponding NAAQS and incorporate additional standards for SO_4^{2-}, H_2S, VCM and visibility reducing particles. **Table 4.2-1** contains both the NAAQS and CAAQS for each of the criteria air pollutants.

If an area does not meet the NAAQS, Federal clean air planning requirements specify that States develop and adopt State Implementation Plans (SIPs), which are air quality plans showing how NAAQS will be attained. In California, EPA has delegated authority to prepare SIPs to the ARB, which in turn has delegated that authority to individual air districts. The EPA also regulates HAPs. One means by which the EPA addresses HAP exposure is through the NESHAPS, which include source-specific regulations that limit allowable emissions of such pollutants.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Pursuant to the FCAA of 1970, the EPA established the NESHAP. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

4.2.2.2 State

CALIFORNIA AIR RESOURCES BOARD

The ARB, part of the California Environmental Protection Agency (Cal-EPA), coordinates and oversees both State and Federal air pollution control programs in California. The ARB monitors existing air quality, establishes CAAQS, and limits allowable emissions from vehicular sources. California has established CAAQS for the six criteria pollutants with NAAQS. The CCAA, effective January 1, 1989, provides a planning framework for attaining the CAAQS. In addition, California has standards for SO_4^{2-}, H_2S, VCM, and visibility reducing particles.[2] The standards for the criteria pollutants are presented in **Table 4.2-1**. In nonattainment areas, local air districts are required to prepare plans for attaining State standards. Attainment plans are required to demonstrate a five percent per year reduction in the emissions of nonattainment pollutants or their precursors, unless all feasible measures are being employed. The NCCAB is designated as nonattainment with respect to the State PM_{10} standard and the State eight-hour O_3 standard.

[2] These standards are designed to protect public health and welfare. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soils, water, visibility, materials, vegetation, and other aspects of general welfare.

CALIFORNIA CLEAN AIR ACT

The CCAA requires that all air districts in the State endeavor to achieve and maintain CAAQS for O_3, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the CCAA provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both State and Federal planning requirements.

ASSEMBLY BILLS 1807 & 2588 - TOXIC AIR CONTAMINANTS

Within California, TACs are regulated primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

CALIFORNIA BUILDING STANDARDS CODE

The California Building Standards Code (CBSC), commonly referred to as Title 24, contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. Included in the CBSC are energy efficiency standards, which are commonly referred to as green building standards or CalGreen standards (California Building Standards Commission [BSC], 2013). The CBSC is adopted every three years by the BSC. In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBSC was most recently updated in 2013. The 2013 energy-efficiency standards are 25 percent more efficient than previous standards for residential construction and 30 percent more efficient for non-residential construction (California Energy Commission [CEC], 2015).

PORTABLE EQUIPMENT REGISTRATION PROGRAM

Owners or operators of portable engines and certain other types of equipment can register their units under the ARB's Statewide Portable Equipment Registration Program (PERP). PERP allows registered equipment to be operated throughout California without having to obtain individual permits from local air districts. To qualify, equipment must meet eligibility requirements, including applicable emissions standards.

4.2.2.3 Regional/Local

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

The MBUAPCD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions are maintained in the NCCAB, within which the proposed project is located. Responsibilities of the MBUAPCD include, but are not limited to, preparing plans for the attainment of AAQS, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological

conditions, and implementing programs and regulations required by the FCAA and the CCAA. In an attempt to achieve NAAQS and CAAQS and maintain air quality, the MBUAPCD has most recently completed the *2008 Air Quality Management Plan (AQMP)* for achieving the O_3 CAAQS and the *2007 Federal Maintenance Plan* for maintaining O_3 NAAQS (MBUAPCD, 2007).

To achieve and maintain AAQS, the MBUAPCD has adopted various rules and regulations for the control of airborne pollutants. The MBUAPCD Rules and Regulations that are applicable to the proposed project include, but are not limited to, the following:

- **Rule 402 (Nuisances).** The purpose of this rule is to prohibit emissions that may create a public nuisance. Applies to any source operation that emits or may emit air contaminants or other materials.
- **Rule 426 (Architectural Coatings).** The purposed of this rule is to limit emissions of volatile organic compounds from architectural coatings.
- **Rule 425 (Use of Cutback Asphalt).** The purposed of this rule is to limit emissions of vapors of organic compounds from the use of cutback and emulsified asphalt. This rule applies to the manufacture and use of cutback, slow cure, and emulsified asphalt during paving and maintenance operations.
- **Rule 207 (New and Modified Source Review).** Rule 207 regulates new and modified stationary sources. The rule incorporates State and Federal requirements for new and modified stationary sources, as well as, MBUAPCD-specific regulations. Rule 207 provides mechanisms by which permits may be granted to sources without interfering with the attainment or maintenance of AAQS.
- **Rule 1010 (Air Toxic Control Measure for Stationary Compression Ignition Engines).** Rule 1010 regulates emissions of TACs emitted from stationary sources, specifically emissions of diesel PM, consistent with State requirements. Rule 1010 provides mechanisms by which permits may be granted to sources to ensure that resultant emissions would not exceed applicable human health risk thresholds.

AIR QUALITY MANAGEMENT PLAN FOR THE MONTEREY BAY REGION

In 1991, the MBUAPCD adopted the *Air Quality Management Plan* for the Monterey Bay Region in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the O_3 standards. The California Clean Air Act requires that AQMPs be updated every 3 years. The MBUAPCD has updated the AQMP five times. The most recent update, the Triennial Plan Revision 2009-2011 was adopted in 2013. The 2012 AQMP relies on a multilevel partnership of Federal, State, regional, and local governmental agencies. These agencies (EPA, ARB, local governments, Association of Monterey Bay Area Governments [AMBAG]), and the MBUAPCD are the primary agencies that implement the AQMP programs. The 2012 AQMP documents the MBUAPCD's progress toward attaining the eight-hour O_3 CAAQS, which is more stringent than the one-hour O_3 CAAQS. The 2013 AQMP builds on information developed in past AQMPs and includes a review and update to the 2008 AQMP. The primary elements from the 2008 AQMP that were updated in the 2012 revision include the air quality trends analysis, emission inventory, and mobile source programs.

RELEVANT PLANNING DOCUMENTS

The 1982 Monterey County General Plan, Carmel Area Land Use Plan, Carmel Area Coastal Implementation Plan, Point Lobos State Reserve and Carmel River State Beach General Plan, CCA, and California PRC contain a variety of policies to improving and maintaining current air quality standards.

Please refer to **Section 4.9, Land Use and Planning** for a description of these regulations and plans, and **Appendix C, Applicable Land Use Plans, Policies, and Regulations Consistency Analysis for the Carmel Lagoon Project** for a list of relevant policies and the consistency analysis.

4.2.3 Impacts and Mitigation

4.2.3.1 Thresholds of Significance

Based on Appendix G of the State CEQA Guidelines, the project would have a significant air quality impact if it would:

a. conflict with or obstruct implementation of the applicable air quality plan;

b. violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c. result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

d. expose sensitive receptors to substantial pollutant concentrations; or

e. create objectionable odors affecting a substantial number of people.

To assist local jurisdictions in the evaluation of air quality impacts, the MBUAPCD has published the *CEQA Air Quality Guidelines* (MBUAPCD, 2008). This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, TAC, and cumulative air quality impacts. The following MBUAPCD-recommended thresholds of significance were relied upon for determination of impact significance:

- **Short-term Emissions of Criteria Air Pollutants**. Construction impacts would be significant if the proposed project would emit greater than 82 pounds per day (lbs/day) of PM_{10}, or will cause a violation of PM_{10} NAAQS or CAAQS at nearby receptors. Construction-generated emissions of O_3 precursors (i.e., ROG or NO_X) are accommodated in the emission inventories of State and federally-required air plans. For this reason, the MBUAPCD has not identified recommended thresholds of significance for construction-generated O_3 precursors.

- **Long-Term Emissions of Criteria Air Pollutants**. Operational impacts would be considered potentially significant if direct and indirect emissions would exceed 137 lbs/day of either ROG or NO_X, 82 lbs/day of PM_{10}, or if the project would contribute to local PM_{10} concentrations that exceed AAQS. Emissions of SO_X would be significant if the project generates direct emissions of greater than 150 lbs/day.

- **Local Mobile-Source CO Concentrations**. Local mobile-source impacts would be significant if the project generates direct emissions of greater than 550 lbs/day of CO or if the project would contribute to local CO concentrations that exceed the CAAQS of 9.0 ppm for 8-hours or 20 ppm for 1-hour. Indirect emissions are typically considered to include mobile sources that access the project site but generally emit off-site; direct emissions typically include sources that emitted on-site (e.g., stationary sources, on-site mobile equipment).

- **Toxic Air Contaminants**. TAC impacts would be significant if the project would expose the public to substantial levels of TACs so that the probability of contracting cancer for the Maximally

Exposed Individual would exceed 10 in 1 million or if concentrations would result in a Hazard Index greater than 1 for the Maximally Exposed Individual.

- **Odorous Emissions**. Odor impacts would be significant if the project has the potential to frequently expose members of the public to objectionable odors.

4.2.3.2 Impact Analysis Overview

APPROACH TO ANALYSIS

Short-term construction and long-term operational emissions of were quantified using the California Emissions Estimator Model (CalEEMod), version 2013.2.2. Short-term construction emissions were quantified based on estimated construction schedules, off-road equipment use, material handing activities, and on-road vehicle trips provided for the proposed project components (i.e., EPB, SRPS, and ISMP). Refer to Appendix A of the *Air Quality & Greenhouse Gas Impact Assessment* (Ambient, 2016; **Appendix D**) for emissions modeling assumptions and results.

Long-term operational emissions were quantified based on energy/equipment usage requirements and maintenance-related vehicle trips associated with the proposed project. Energy usage associated with the proposed pumps were quantified based on calculated annual electricity use and emission factors derived from the CalEEMod computer program and South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook (SCAQMD, 1998). Operational mobile-source emissions associated with maintenance worker trips were quantified using the CalEEMod computer program assuming a total of four worker trips/day, one day per week. This is a very conservative estimate as actual maintenance related vehicle trips would be significantly less (please refer to **Section 4.12**, **Traffic and Circulation**). Evaporative VOC emissions associated with the occasional maintenance/recoating of metal proposed project components were also quantified based on an estimated 100 square feet of surface area recoated on any given day. Off-road equipment use associated with occasional maintenance activities assumed the operation of one tractor for landscape maintenance and one generator for metal recoating applications could potentially occur on the same day. Refer to Appendix A of the *Air Quality & Greenhouse Gas Impact Assessment* (Ambient, 2016; **Appendix D**) for emissions modeling assumptions and results.

A screening-level health risk assessment was conducted for the proposed emergency generator utilizing a risk screening spreadsheet provided by the MBUAPCD. The emergency generator required for the proposed project was estimated to be 240 bhp in size and the fuel source has not yet been identified. To ensure a conservative analysis, the generator was assumed to be diesel fueled, 250 bhp in size, and without the inclusion of toxic best available control technology (TBACT). The generator would be required to comply with MBUAPCD permitting requirements (Rule 207 – New and Modified Source Review) or be registered under CCR Title 13, Article 5, Sections 2450 through 2465 (PERP), if applicable. These regulations would limit new generator operations for testing and maintenance to a maximum of 50 hours annually. No daily limit for testing and maintenance is identified. To ensure a conservative analysis, daily operational period was assumed to be 24 hours. Actual daily testing periods are typically limited to a few hours.

AREAS OF NO IMPACT

All of the Threshold of Significance criteria outlined above are applicable to the proposed project.

4.2.3.3 Impacts and Mitigation Measures

Impact AQ-1: <u>Conflict with or Obstruct Implementation of Applicable Air Quality Plans</u>. The construction and operation of the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (Criterion a) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

Consistency with the AQMP is assessed by comparing the proposed growth associated with a proposed project with the population and dwelling unit forecasts adopted by the AMBAG. These projections are used to generate emission forecasts upon which the AQMP is based. Projects that are consistent with AMBAG's regional forecasts are considered consistent with the AQMP (MBUAPCD, 2008). Projects that would result in a significant increase in emissions, in excess of MBUAPCD significance thresholds, would potentially conflict with or obstruct implementation of the AQMP.

The proposed project would not result in a substantial increase in employment, or population growth, nor would the proposed project result in significant short-term or long-term increases of criteria air pollutants. For these reasons, implementation of the proposed project is not anticipated to result in a substantial increase in either direct or indirect emissions that would conflict with or obstruct implementation of the AQMP. This impact is less-than-significant. No mitigation is required. (Please refer to **Impacts AQ-3** and **AQ-4** for a more detailed discussion of air quality impacts.)

Impact Conclusion

This proposed project would not cause and/or otherwise induce population growth and would not cause any long-term adverse air quality affects. The proposed project would not conflict with and/or otherwise obstruct the implementation of MBUAPCD AQMP. This impact is less-than-significant.

Impact AQ-2: <u>Violate any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation</u>. The construction and operation of the proposed project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. (Criterion b) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

As discussed in **Impacts AQ-3** and **AQ-4**, the construction and operation of the proposed project would not result in short-term or long-term increases in emissions that would violate any air quality standard or contribute to an existing or projected air quality violation. As a result, this impact is less-than-significant. No mitigation is required. (Please refer to **Impacts AQ-3** and **AQ-4** for additional discussion of air quality impacts.)

Impact Conclusion

The proposed project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, this impact is less-than-significant. No mitigation measures are required.

Impact AQ-3: <u>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</u>. The construction and operation of the proposed 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 Federal or State ambient air quality standard, including releasing emissions which exceed quantitative thresholds for ozone precursors. (Criterion c) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

<u>CONSTRUCTION EMISSIONS</u>

Construction-generated emissions are short-term and of temporary duration, lasting only as long as construction activities occur, but possess the potential to represent a significant air quality impact. The construction of the proposed project would result in the temporary generation of emissions resulting primarily from site preparation and excavation, asphalt paving, as well as, motor vehicle exhaust associated with off-road construction equipment and on-road vehicle trips. Emissions of PM are largely associated with ground disturbance and the movement of construction vehicles and equipment on unpaved surfaces.

Construction-generated emissions associated with development of the proposed project, including each of the individual proposed project components, are summarized in **Table 4.2-4**. The proposed project would generate a maximum daily emissions of approximately 7.18 lbs/day of ROG, 72.93 lbs/day of NO_X, 11.99 lbs/day of PM_{10} and 7.11 lbs/day of $PM_{2.5}$. Emissions of PM would largely occur during the initial site preparation and excavation activities. Construction activities would not generate PM_{10} emissions that would exceed the MBUAPCD's significance threshold of 82 lbs/day. Furthermore, compliance with existing MBUAPCD rules and regulations, such as Rule 402 (Nuisances) and Rule 425 (Use of Cutback Asphalt) would further minimize potential short-term air quality impacts. As a result, short-term construction activities are less-than-significant. No mitigation is required.

Table 4.2-4. Construction Emissions - Uncontrolled

Proposed Project Components/ Construction Activity	Emissions (lbs/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
EPB				
Site Preparation/Excavation/Road Removal[2]	3.11	32.74	7.97	4.93
Subgrade	2.38	23.25	1.78	1.28
Paving	1.44	14.53	0.96	0.83
Sheet Pile Wall Installation	2.36	20.98	1.55	1.17
Pump Station/Generator Building Install	1.33	14.59	0.85	0.72
Architectural Coating[3]	1.03	6.17	0.50	0.46
Highest Daily Emissions for EPB:	3.11	32.74	7.97	4.93
SRPS				
Site Preparation / Excavation	2.87	30.97	1.83	1.57
Rock Placement	3.16	31.88	2.25	1.52
Backfilling	1.11	10.86	0.78	0.66
Highest Daily Emissions for SRPS:	3.16	31.88	2.25	1.52
ISMP[5]				
Sand Bag Placement	0.91	8.31	1.77	0.61

Proposed Project Components/ Construction Activity	Emissions (lbs/day)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Sand Bag Removal	0.91	8.31	1.77	0.61
Sand Bar Management	0.05	0.08	0.08	0.02
Highest Daily Emissions for ISMP:	0.91	8.31	1.77	0.61
Maximum Daily Emissions[4]:	7.18	72.93	11.99	7.11
MBUAPCD Significance Threshold[5]:	-	-	82	-
Exceeds Threshold/Significant Impact?	NA	NA	No	NA

1. Estimated emissions include onsite off-road equipment use, material handling, and off-site motor vehicle use.
2. Includes demolition/removal of roughly 400 lf of Carmelo Street.
3. Assumes equivalent of 1,200 sq.ft. painted daily, 250 g/L VOC content.
4. Assumes highest daily emissions from each proposed project component could potentially occur simultaneously on the same day.
5. ISMP would only occur during short-term/construction, prior to completion of EPB and SRPS

Refer to Appendix A of the *Air Quality & Greenhouse Gas Impact Assessment* (Ambient, 2016; **Appendix D)** for emissions modeling assumptions and results.

OPERATIONAL EMISSIONS

Operational emissions associated with the proposed project would be primarily associated with routine maintenance activities and electricity use. The testing/maintenance of the proposed emergency generator would also contribute intermittently to operational emissions. Daily operational emissions are summarized in **Table 4.2-5**. Assuming that all maintenance and operational activities at both the EPS and SRPS locations were to occur on the same day, the proposed project would generate emissions of approximately 4.7 lbs/day of ROG, 58.0 lbs/day of NO_X, 23.1 lbs/day of CO, 1.1 lbs/day of SO_X, 2.3 lbs/day of PM_{10}, and 2.3 lbs/day of $PM_{2.5}$. Daily operational emissions would not exceed applicable MBUAPCD significance thresholds. In addition, it is important to note the proposed emergency generator would be subject to MBUAPCD permitting requirements for stationary emissions sources, in accordance with MBUAPCD Rule 207. Compliance with MBUAPCD permitting requirements would include limitations on the emissions generated and hours of testing and operation sufficient to ensure that operational emissions from this source would not exceed stationary-source permitting thresholds. For these reasons, the long-term operation of the proposed project would have a less-than-significant impact on air quality. No mitigation is required.

Table 4.2-5. Operational Emissions

Proposed Project Component/Source	Emissions (lbs/day) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
EPB						
Repainting[1]	0.27	--	--	--	--	--
Off-road Maintenance Equipment[2]	0.74	6.14	4.98	0.01	0.47	0.45
Maintenance Worker Motor Vehicles[3]	0.02	0.03	0.25	0.00	0.03	0.01
Electricity Use[4]	0.08	9.65	1.68	1.01	0.34	0.34
Emergency Generator [5]	2.8	36.0	11.0	0.10	1.00	1.00
Total EPB Emissions:	3.9	51.8	17.9	1.1	1.8	1.8
SRPS						
Off-road Maintenance Equipment[2]	0.74	6.14	4.98	0.01	0.47	0.45
Maintenance Worker Motor Vehicles[3]	0.02	0.03	0.25	0.00	0.03	0.01
Total SRPS Emissions:	0.8	6.2	5.2	0.0	0.5	0.5
Maximum Daily Emissions:	4.7	58.0	23.1	1.1	2.3	2.3
MBUAPCD Significance Thresholds:	137	137	550	150	82	-
Exceeds Threshold/Significant Impact?	No	No	No	No	No	NA

Proposed Project Component/Source	Emissions (lbs/day) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$

1. Includes evaporative emissions for repainting. Assumes equivalent of 1,200 sq. ft. painted per day, maximum VOC content of 250 g/L for industrial maintenance coatings.
2. Off-road maintenance equipment includes the use of one compressor for painting applications and one off-road tractor for landscape maintenance. Assumes both activities were to occur simultaneously on a given day. Emissions were calculated using the CalEEMod computer program.
3. Maintenance worker trips assume 4 trips per day based on CalEEMod default parameters for worker commute trips in Monterey County.
4. Energy use was calculated based on SCAQMD-recommended emissions factors assuming the operation of one 100-hp duty pump and one 25-hp jockey pump, each operating an average of four hours per 24-hour period.
5. Based on pump electrical demand an approximate 240-bhp generator would be required. To be conservative, a 250 bhp diesel-fueled generator operating 24-hours at 0.75 load was assumed.Generator testing typically operate at lower load levels and for shorter periods of time.
6. Maximum daily emissions assumes EPB and SRPS emissions were to occur simultaneously on the same day.

Refer to Appendix A of the *Air Quality & Greenhouse Gas Impact Assessment* (Ambient, 2016; **Appendix D)** for emissions modeling assumptions and results.

Impact Conclusion

The proposed 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors). This represents a less-than-significant impact and no mitigation is required.

Impact AQ-4: <u>Expose Sensitive Receptors to Substantial Pollutant Concentration</u>. The construction and operation of the proposed project would not expose sensitive receptors to substantial pollutant concentrations. (Criterion d) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

<u>CONSTRUCTION/SHORT-TERM EXPOSURE</u>

Implementation of the proposed project would result in short-term emissions of fugitive PM associated with project construction. Localized pollutants of primary concern typically associated with construction projects are commonly associated with increased emissions of PM generated by ground disturbance, including site preparation and grading. However, the proposed project would not require the demolition of existing structures, nor would the proposed project result in emissions that would exceed MBUAPCD significance thresholds. Compliance with applicable MBUAPCD rules and regulations, including but not limited to Rule 402, would minimize potential nuisance impacts to occupants of nearby land uses. As a result, construction activities would have a less-than-significant short-term impact to nearby sensitive receptors. No mitigation is required.

<u>OPERATION/LONG-TERM EXPOSURE</u>

Potential sources of long-term exposure to pollutant concentrations associated with the proposed project would be primarily associated with the installation of the proposed emergency generator. The proposed generator would be housed within a control building located adjacent to and east of Carmelo Street, approximately 40 feet north of the proposed pump station. The nearest receptors in the vicinity of the proposed control building are located approximately 35 feet to the northeast and approximately 40 feet to the west, across Carmelo Street. The size of the proposed generator would be approximately 240 brake horsepower. The fuel source for the generator has not yet been identified.

A screening-level health risk assessment was conducted for the proposed emergency generator based on updated methodologies contained in the MBUAPCD's health-risk screening spreadsheet. To ensure a conservative analysis, the generator was assumed to be diesel fueled, without the inclusion of TBACT.

As noted earlier, diesel exhaust PM has been identified as a TAC. Based on the analysis, the proposed generator would result in a cancer risk of approximately 4.8 in a million and a hazard index of 0.72.

For the assessment of potential health-related impacts associated with TACs, the MBUAPCD has established stationary source cancer-risk thresholds of one in 100,000 (i.e., 10 in one million) and a non-cancer risk hazard index of one. Stationary emission sources that exceed these thresholds would be considered to have a potentially significant impact. Based on the screening health risk assessment conducted, the proposed emergency generator would not result in increased health risks to the nearest receptors that would exceed MBUAPCD's significance thresholds. It is also important to note that the proposed emergency generator would be required to comply with MBUAPCD permitting requirements, including, but not limited to, Rule 207–New and Modified Source Review and Rule 1010–Air Toxic Control Measure for Stationary Compression Ignition Engines. Depending on the generator to be installed, TBACT may also be required, which would further reduce potential health risks associated with the operation of the emergency generator. For these reasons, this impact would be less-than-significant. No mitigation measures are required.

Impact Conclusion

The proposed project would not result in exposure of sensitive receptors to substantial pollutant concentrations. This represents a less-than-significant impact and no mitigation is required.

Impact AQ-5: <u>Create Objectionable Odors Affecting a Substantial Number of People.</u> The construction and operation of the proposed project would not create objectionable odors affecting a substantial number of people. (Criterion e) (EPB: Less-than-Significant) (SRPS: Less-than-Significant) (ISMP: Less-than-Significant) (Project Overall: Less-than-Significant)

The construction and operation of the proposed project would not result in the installation of any major sources of odors. No major sources of odors have been identified in the vicinity of the proposed project site. As a result, implementation of the proposed project would not result in the long-term exposure of a substantial number of individuals to increased concentrations of odors. However, construction of the proposed project would involve the use of a variety of gasoline and diesel-powered equipment, as well as, paving activities that would emit odors. In addition, operation of the emergency generator could result intermittent short-term emissions of diesel exhaust, if diesel fueled. However, these sources are not considered major odor sources of concern by the MBUAPCD (MBUAPCD, 2008). In addition, emissions from these sources would occur intermittently throughout the workday and would dissipate rapidly within increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. For these reasons, this impact is less-than-significant. No mitigation is required.

Impact Conclusion

The proposed project would not create objectionable odors that would affect a substantial number of people. This represents a less-than-significant impact and no mitigation is required.

4.2.4 References

[Ambient] Ambient Air Quality & Noise Consulting. 2016. Air Quality & Greenhouse Gas Impact Assessment for Carmel Lagoon EPB, SRPS, and ISMP Project; Monterey County CA. March 2016.

[ARB] California Air Resources Board. Aerometric Data Division. January 1992. California Surface Wind Climatology.

[ARB] California Air Resources Board. 2000. Diesel Risk Reduction Plan. Available online at: http://www.arb.ca.gov/diesel/documents/rrpapp.htm.

[ARB] California Air Resources Board. 2013. California Almanac of Emissions & Air Quality.

[ARB] California Air Resources Board. 2015. Air Quality Data. Available online at: http://www.arb.ca.gov/html/ds.htm

[ARB] California Air Resources Board. 2016. Accessed: May 2016. Ambient Air Quality Standards. Available online at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

[BSC] California Building Standards Commission. 2013. California Green Building Standards Code. Available online at: http://www.bsc.ca.gov/Home/CALGreen.aspx.

[CEC] California Energy Commission. Accessed: May 1, 2015. Energy Commission Approves More Efficient Buildings for California's Future. Available online at: http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html.

[MBUAPCD] Monterey Bay Unified Air Pollution Control District. 2007. 2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region. Available online at: http://mbuapcd.org/pdf/451.pdf .

[MBUAPCD] Monterey Bay Unified Air Pollution Control District. 2008. CEQA Air Quality Guidelines.

[MBUAPCD] Monterey Bay Unified Air Pollution Control District. 2015. NCCAB Area Designations and Attainment Status. Available online at: http://mbuapcd.org/wp-content/uploads/2015/01/attainment-status-january-2015.pdf.

[SCAQMD] South Coast Air Quality Management District.1998. CEQA Air Quality Handbook.

[EPA] U.S. Environmental Protection Agency. Accessed: November 12, 2014. Technology Transfer Network – Pollutants and Sources. Available online at: http://www.epa.gov/ttn/atw/pollsour.html.

[EPA] U.S. Environmental Protection Agency. Accessed: May 19, 2015. AirData: Monitor Values Report. Available online at: http://www.epa.gov/airquality/airdata/ad_rep_mon.html.

This Page Intentionally Left Blank