3.2 - Air Quality

3.2.1 - Introduction

This section describes existing air quality conditions regionally and locally as well as the relevant regulatory framework. This section also evaluates the possible impacts related to air quality that could result from implementation of the project. Information included in this section is based on project-specific air quality modeling results included in Appendix B. No public comments were received during the Environmental Impact Report (EIR) scoping period related to air quality.

3.2.2 - Environmental Setting

Regional Geography and Climate

Contra Costa County is located within the San Francisco Bay Area Air Basin (Air Basin or SFBAAB). The Air Basin is approximately 5,600 square miles in area and consists of nine counties that surround the San Francisco Bay, including all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties; the southwestern portion of Solano County; and the southern portion of Sonoma County. The San Francisco Bay Area (Bay Area) has a Mediterranean climate characterized by mild, dry summers and mild, moderately wet winters; moderate daytime onshore breezes, and moderate humidity.

A semi-permanent, high-pressure area centered over the northeastern Pacific Ocean dominates the summer climate of the West Coast. Because this high-pressure cell is persistent, storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest airflow and negligible precipitation. A thermal low-pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the Bay Area much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific High (a high-pressure cell) exerts stress on the ocean surface along the west coast. This induces upwelling of cold water from below the surface. Upwelling produces a band of cold water off San Francisco that is approximately 80 miles wide. During July, the surface waters off San Francisco are 3 degrees Fahrenheit (°F) cooler than those off Vancouver, British Columbia, more than 900 miles to the north. Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation—a high incidence of fog and stratus clouds along the northern California coast in summer.

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the gap in the western Coast Ranges, known as the Golden Gate, and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate[1] produces a jet that sweeps eastward but widens

[1] A strait on the West Coast of North America that connects the San Francisco Bay to the Pacific Ocean.

downstream, producing southwest winds at Berkeley and northwest winds at San José; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Golden Gate, the Carquinez Strait, or San Bruno Gap. For example, the average wind speed at San Francisco International Airport from 3:00 a.m. to 4:00 p.m. in July is about 20 miles per hour (mph), compared with only about 8 mph at San José and less than 7 mph at the Farallon Islands.

The sea breeze between the coast and the Central Valley[2] commences near the surface along the coast in late morning or early afternoon; it may first be observed only through the Golden Gate. Later in the day, the layer deepens and intensifies while spreading inland. As the breeze intensifies and deepens, it flows over the lower hills farther south along the peninsula. This process frequently can be observed as a bank of stratus clouds "rolling over" the coastal hills on the west side of the Bay. The depth of the sea breeze depends in large part upon the height and strength of the inversion. The generally low elevation of this stable layer of air prevents marine air from flowing over the coastal hills. It is unusual for the summer sea breeze to flow over terrain exceeding 2,000 feet in elevation.

In winter, the SFBAAB experiences periods of storminess, moderate-to-strong winds, and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon, and otherwise light and variable winds.

A primary factor in air quality is the mixing depth (the vertical air column available for dilution of contaminant sources). Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This is caused by most of the sun's energy being converted to sensible heat at the ground, which in turn warms the air at the surface. The warm air rises in the atmosphere, where it expands and cools. Sometimes, however, the temperature of air actually increases with height. This condition is known as temperature inversion, because the temperature profile of the atmosphere is "inverted" from its usual state. Over the SFBAAB, the frequent occurrence of temperature inversions limits mixing depth and, consequently, limits the availability of air for dilution.

Air Pollutant Types, Sources, and Effects

Criteria Air Pollutants

Concentrations of criteria air pollutants are used as indicators of air quality conditions. Air pollutants are termed criteria air pollutants if they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. According to the United States Environmental Protection Agency (EPA), criteria air pollutants are ozone, particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), carbon monoxide (CO), lead, and sulfur dioxide (SO_2). Table 3.2-1 provides a summary of the types, sources, and effects of criteria air pollutants of national and California concern.

[2] A flat valley that dominates the geographical center of California stretching 450 miles from north-northwest to south-southeast, inland from and parallel to the Pacific Ocean coast. It is bounded by the Sierra Nevada to the east and the Coast Range to the west.

Table 3.2-1: Description of Criteria Pollutants of National and California Concern

Criteria Pollutant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Ozone	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), nitrous oxides (NO_X), and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_X) are mobile sources (on-road and off-road vehicle exhaust).	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.
Particulate matter (PM_{10}) Particulate matter ($PM_{2.5}$)	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is between 2.5 and 10 microns in diameter, (1 micron is 1-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about 1/13 the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.	• Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. • Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.
Nitrogen dioxide (NO_2)	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides—NO_X (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NO_X is a precursor to ozone, PM_{10}, and $PM_{2.5}$ formation. NO_X can react with compounds to form nitric acid and related small particles and result in PM related health effects.	NO_X is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. NO_2 forms quickly from NO_X emissions. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contributions to atmospheric discoloration; increased visits to hospital for respiratory illnesses.

Table 3.2-1 (cont.): Description of Criteria Pollutants of National and California Concern

Criteria Pollutant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Carbon monoxide (CO)	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.	Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.
Sulfur dioxide (SO_2)	SO_2 is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO_X) include SO_2 and sulfur trioxide. Sulfuric acid is formed from SO_2, which can lead to acid deposition and can harm natural resources and materials. Although SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because SO_2 is a precursor to sulfate and PM_{10}.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of SO_2. The gas can also be produced in the air by dimethyl sulfide and hydrogen sulfide. SO_2 is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The SO_2 levels in the State are well below the maximum standards.	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.
Lead	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.

Source: South Coast Air Quality Management District (SCAQMD) 2007a; California Environmental Protection Agency (Cal/EPA) 2002; California Air Resources Board (ARB) 2009; United States Environmental Protection Agency (EPA) 2003, 2009a, 2009b, 2010, 2011a, and 2012; National Toxicology Program 2011a and 2011b

Toxic Air Contaminants

Concentrations of toxic air contaminants (TAC) are also used as indicators of air quality conditions. TACs are defined as air pollutants that may cause or contribute to an increase in mortality or serious illness or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at very low concentrations. TACs can cause long-term health effects (such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage) or short-term acute affects (such as eye watering, respiratory irritation, runny nose, throat pain, or headaches). For those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which some adverse health impacts are not expected to occur. This contrasts with the criteria pollutants such as nitrogen dioxide and carbon dioxide for which acceptable levels of exposure can be determined and for which the State and federal governments have set ambient air quality standards.

TACs are separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to a particular TAC. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Cancer risk is typically expressed as excess cancer cases per million exposed individuals, typically over a lifetime exposure or other prolonged duration. For noncarcinogenic substances, there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels may vary depending on the specific pollutant. Acute and chronic exposure to noncarcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels.

To date, the California Air Resources Board (ARB) has designated nearly 200 compounds as TACs. The ARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most important being diesel particulate matter (DPM) from diesel-fueled engines. Common TACs of national and California concern include: DPM, volatile organic compounds (VOCs), benzene, asbestos, hydrogen sulfide, sulfates, visibility-reducing particulates, vinyl chloride, and lead. Table 3.2-2 provides a summary of the types, sources, and effects of TACs of national and California concern.

Table 3.2-2: Description of Toxic Air Contaminants of National and California Concern

Toxic Air Contaminant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Diesel Particulate Matter (DPM)	DPM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.	Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.
VOCs	Reactive organic gases (ROGs), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably.	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.	Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as toxic air contaminants.

Table 3.2-2 (cont.): Description of Toxic Air Contaminants of National and California Concern

Toxic Air Contaminant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Benzene	Benzene is a VOC. It is a clear or colorless light-yellow, volatile, highly flammable liquid with a gasoline-like odor. The EPA has classified benzene as a "Group A" carcinogen.	Benzene is emitted into the air from fuel evaporation, motor vehicle exhaust, tobacco smoke, and from burning oil and coal. Benzene is used as a solvent for paints, inks, oils, waxes, plastic, and rubber. Benzene occurs naturally in gasoline at one to two percent by volume. The primary route of human exposure is through inhalation.	Short-term (acute) exposure of high doses from inhalation of benzene may cause dizziness, drowsiness, headaches, eye irritation, skin irritation, and respiratory tract irritation, and at higher levels, loss of consciousness can occur. Long-term (chronic) occupational exposure of high doses has caused blood disorders, leukemia, and lymphatic cancer.
Asbestos	Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and crocidolite.	Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States.	Exposure to asbestos is a health threat; exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease that causes scarring of the lungs). Exposure to asbestos can occur during demolition or remodeling of buildings that were constructed prior to the 1977 ban on asbestos for use in buildings. Exposure to naturally occurring asbestos can occur during soil-disturbing activities in areas with deposits present.
Hydrogen Sulfide	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.

Table 3.2-2 (cont.): Description of Toxic Air Contaminants of National and California Concern

Toxic Air Contaminant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Sulfates	The sulfate ion is a polyatomic anion with the empirical formula SO42−. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of SO_2. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.
Visibility Reducing Particles	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is between 2.5 and 10 microns in diameter (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal; and recycling. Mobile or transportation-related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.	• Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravates existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. • Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.
Vinyl Chloride	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.

Table 3.2-2 (cont.): Description of Toxic Air Contaminants of National and California Concern

Toxic Air Contaminant	Physical Description and Properties	Sources	Most Relevant Effects from Pollutant Exposure
Lead	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.

Source: South Coast Air Quality Management District (SCAQMD) 2007a; California Environmental Protection Agency (Cal/EPA) 2002; California Air Resources Board (ARB) 2009; United States Environmental Protection Agency (EPA) 2003, 2009a, 2009b, 2010, 2011a, and 2012; National Toxicology Program 2011a and 2011b.

Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature inversions interact with the physical features of the landscape to determine the movement and dispersal of air pollutant emissions and, consequently, their effect on air quality.

Regional Air Quality

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction for regulating air quality within the nine-county SFBAAB.

Air Pollutant Standards and Attainment Designations

Air pollutant standards have been identified by the EPA and the ARB for the following six criteria air pollutants that affect ambient air quality: ozone, NO_2, CO, SO_2, lead, and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 microns in diameter (PM_{10}), and PM equal to or less than 2.5 microns in diameter ($PM_{2.5}$). These air pollutants are called "criteria air pollutants," because they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. California has also established standards for toxic air contaminants such as visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Table 3.2-3 presents the National Ambient Air Quality Standards (NAAQS) and California ambient air quality standards (CAAQS) for these aforementioned air pollutants. Note that there are no State or federal air quality standards for VOCs, benzene, or DPM.

Table 3.2-3: Federal and State Air Quality Standards in the SFBAAB

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]
Ozone	1 Hour	0.09 ppm	—
	8 Hour	0.070 ppm	0.070 ppm[f]
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm
	Annual	0.030 ppm	0.053 ppm
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm
	8 Hour	9.0 ppm	9 ppm
Sulfur dioxide[c] (SO_2)	1 Hour	0.25 ppm	0.075 ppm
	3 Hour	—	0.5 ppm
	24 Hour	0.04 ppm	0.14 (for certain areas)
	Annual	—	0.030 ppm (for certain areas)
Lead[e]	30-day	1.5 µg/m^3	—
	Quarter	—	1.5 µg/m^3
	Rolling 3-month average	—	0.15 µg/m^3
Particulate matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3
	Mean	20 µg/m^3	—
Particulate matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3
	Annual	12 µg/m^3	12.0 µg/m^3
Visibility-reducing particles	8 Hour	See note below[d]	
Sulfates	24 Hour	25 µg/m^3	—
Hydrogen sulfide	1 Hour	0.03 ppm	—
Vinyl chloride[e]	24 Hour	0.01 ppm	—

Notes:
ppm = parts per million (concentration)   µg/m^3 = micrograms per cubic meter   Annual = Annual Arithmetic Mean
30-day = 30-day average   Quarter = Calendar quarter

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3-Hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour nitrogen dioxide 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 (0.100 ppm).

[c] 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 part per billion (ppb). The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[d] Visibility reducing particles: In 1989, the ARB converted both the general Statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the Statewide and Lake Tahoe Air Basin standards, respectively.

[e] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[f] The EPA Administrator approved a revised 8-hour ozone standard of 0.07 ppb on October 1, 2015. The new standard went into effect 60 days after publication of the Final Rule in the Federal Register. The Final Rule was published in the Federal Register on October 26, 2015 and became effective on December 28, 2015.

Source of effects, properties, and sources: South Coast Air Quality Management District (SCAQMD) 2007a; California Environmental Protection Agency (Cal/EPA) 2002; California Air Resources Board (ARB) 2009; United States Environmental Protection Agency (EPA) 2003, 2009a, 2009b, 2010, 2011a, and 2012; National Toxicology Program 2011a and 2011b. Source of Standards: California Air Resources Board (ARB) 2013c.

Ambient air pollutant concentrations in the SFBAAB are measured at air quality monitoring stations operated by the ARB and BAAQMD. In general, the SFBAAB experiences low concentrations of most pollutants compared to federal or State standards.

Both the EPA and ARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. "Attainment" status refers to those regions that are meeting federal and/or State standards for a specified criteria pollutant. "Nonattainment" refers to regions that do not meet federal and/or State standards for a specified criteria pollutant. "Unclassified" refers to regions where there is not enough data to determine the region's attainment status for a specified criteria air pollutant. Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

The current attainment designations for the SFBAAB are shown in Table 3.2-4. The SFBAAB is designated as nonattainment for the State ozone, PM_{10}, and $PM_{2.5}$, standards and nonattainment for the national ozone and $PM_{2.5}$ standards.

Table 3.2-4: San Francisco Bay Area Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$	Nonattainment	Nonattainment
Sulfates	Attainment	N/A
Hydrogen Sulfates	Unclassified	N/A
Visibility-reducing Particles	Unclassified	N/A
Lead	N/A	Attainment

Source: Bay Area Air Quality Management District (BAAQMD). 2017. Air Quality Standards and Attainment Status. January. Website: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed February 8, 2019.

Air Quality Index

The health impacts of the various air pollutants of concern can be presented in a number of ways. The clearest comparison is to the State and federal ozone standards. If concentrations are below the standard, it is safe to say that no health impact would occur to anyone. When concentrations exceed the standard, impacts will vary based on the amount by which the standard is exceeded. The EPA developed the Air Quality Index (AQI) as an easy-to-understand measure of health impacts compared with concentrations in the air. Table 3.2-5 provides a general description of the health impacts of ozone at different concentrations.

Table 3.2-5: Air Quality Index and Health Effects from Ozone

Air Quality Index/ 8-hour Ozone Concentration	Health Effects Description
AQI—51–100—Moderate	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 55–70 ppb	**Health Effects Statements**: Unusually sensitive individuals may experience respiratory symptoms.
	Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.
AQI—101–150—Unhealthy for Sensitive Groups	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 86–105 ppb	**Health Effects Statements**: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
AQI—151–200—Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 86–105 ppb	**Health Effects Statements**: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
AQI—201–300—Very Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 106–200 ppb	**Health Effects Statements**: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

Source: Air Now. 2015. AQI Calculator: AQI to Concentration. Website: http://www.airnow.gov/index.cfm?action=resources.aqi_conc_calc. Accessed July 2, 2018.

Local Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature inversions interact with the physical features of the landscape to determine the movement and dispersal of air pollutant emissions and, consequently, their effect on air quality.

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. The air quality monitoring station closest to the project site is the Concord-Treat Boulevard Avenue Air Monitoring Site, which is located approximately 1.5 miles northeast of the project site. Table 3.2-6 summarizes the recorded ambient air data at the representative monitoring stations for years 2015 through 2017, which is the most current data available at the time of this writing. As Table 3.2-6 shows, the recorded data show exceedances of the California standards for ozone (1-hour, and 8-hour) and national standards for 8-hour ozone and $PM_{2.5}$ (24-hour) on multiple occasions from 2015 through 2017. No exceedances of either the State or national standards were recorded for CO, NO_2, SO_2, or PM_{10}. No recent monitoring data for Contra Costa County or the San Francisco Air Basin was available for CO or SO_2. Generally, no monitoring is conducted for pollutants that are no longer likely to exceed ambient air quality standards.

Table 3.2-6: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2015	2016	2017
Ozone[(1)]	1 Hour	Max 1 Hour (ppm)	0.088	**0.095**	0.082
		Days > State Standard (0.09 ppm)	0	1	0
	8 Hour	Max 8 Hour (ppm)	**0.074**	**0.075**	0.070
		Days > State Standard (0.07 ppm)	4	2	0
		Days > National Standard (0.070 ppm)[(2)]	2	2	0
CO	8 Hour	Max 8 Hour (ppm)	ND	ND	ND
		Days > State Standard (9.0 ppm)	ND	ND	ND
		Days > National Standard (9 ppm)	ND	ND	ND
NO_2[(1)]	Annual	Annual Average (ppm)	0.007	0.006	0.006
	1 Hour	Max 1 Hour (ppm)	0.033	0.0336	0.0406
		Days > State Standard (0.18 ppm)	0	0	0
SO_2	Annual	Annual Average (ppm)	ND	ND	ND
	24 Hour	Max 24 Hour (ppm)	ND	ND	ND
		Days > State Standard (0.04 ppm)	ND	ND	ND
Inhalable coarse particles (PM_{10})[(1)]	Annual	Annual Average (µg/m^3)	14	14	13
	24 hour	24 Hour (µg/m^3)	24.0	19.0	41.0
		Days > State Standard (50 µg/m^3)	0	0	ID
		Days > National Standard (150 µg/m^3)	0	0	ID

Table 3.2-6 (cont.): Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2015	2016	2017
Fine particulate matter ($PM_{2.5}$)[(1)]	Annual	Annual Average (µg/m^3)	8.8	5.9	12.0
	24 Hour	24 Hour (µg/m^3)	31.0	20.7	**89.4**
		Days > National Standard (35 µg/m^3)	0	0	6

Notes:
> = exceed; ppm = parts per million; µg/m^3 = micrograms per cubic meter
ID = insufficient data; ND = no data; max = maximum
Bold = exceedance
State Standard = California Ambient Air Quality Standard
National Standard = National Ambient Air Quality Standard
(1) Concord-Treat Boulevard
(2) On October 1, 2015, the EPA strengthened the NAAQS for ground-level ozone to 70 parts per million through the adoption of a new standard. The Final Rule went into effect on December 28, 2015.
Source: California Air Resources Board (ARB). 2018. iADAM: Air Quality Data Statistics, Concord–Treat Boulevard BAAQMD Air Monitoring Site. Website: https://www.arb.ca.gov/adam. Accessed February 27, 2019.

Air Pollution Sensitive Receptors

Air pollution does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others are. Land uses such as residences, schools, day care centers, hospitals, nursing and convalescent homes, and parks are considered to be the most sensitive to poor air quality, because the population groups associated with these uses have increased susceptibility to respiratory distress or, as in the case of residential receptors, their exposure time is greater than that for other land uses. Therefore, these groups are referred to as sensitive receptors. Exposure assessment guidance typically assumes that residences would be exposed to air pollution 24 hours per day, 350 days per year, for 70 years. BAAQMD defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, day care centers, hospitals, and senior-care facilities.

Project Site Vicinity

The project site is surrounded by existing residences to the north, east, and south of the project site. The closest off-site air pollution sensitive receptors in the vicinity of the project site include multi-family apartments adjacent to and east of the project site. Specifically, the closest residences to the project site are located approximately 20 feet east of the project site.

Project Site

There are currently two residences that are considered air pollution sensitive receptors located on the project site.

Existing Air Pollutant Emissions

Project Site Vicinity

The primary sources of air pollutants (both criteria air pollutant and TACs) in the project site vicinity are the building-related energy use and motor-related vehicle trips associated with the local residential uses. Other sources of emissions include space and water heating, landscape maintenance, and consumer products from nearby residential use as well as the emissions associated with rail travel along the Bay Area Rapid Transit (BART) right-of-way northwest of the project site. It should be noted that BART operates electric-powered trains and, hence, is not considered a major generator of TAC emissions.

Project Site

The source of air pollutants (both criteria air pollutant and TACs) currently at the project site are primarily from building-related energy use and motor-related vehicle trips associated with the two on-site residences.

3.2.3 - Regulatory Framework

Federal

Clean Air Act

Congress established much of the basic structure of the Clean Air Act (CAA) in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the CAA. These are particulate matter, ground-level ozone, CO, sulfur oxides, nitrogen oxides, and lead. The EPA calls these pollutants criteria air pollutants, because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health are called primary standards. Another set of limits intended to prevent environmental and property damage are called secondary standards (EPA 2014)[3]. The federal standards are called NAAQS. The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards.

The federal standards were set to protect public health, including that of sensitive individuals; thus, the EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

The Clean Air Act also requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies.

[3] United States Environmental Protection Agency (EPA). 2014. Clean Air Act Requirements and History. Website: https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history. Accessed April 25, 2016.

EPA Emission Standards for New Off-Road Equipment

Before 1994, there were no standards to limit the amount of emissions from off-road equipment. In 1994, the EPA established emission standards for hydrocarbons, NO_X, CO, and PM to regulate new pieces of off-road equipment. These emission standards came to be known as Tier 1. Since that time, increasingly more stringent Tier 2, Tier 3, and Tier 4 (interim and final) standards were adopted by the EPA, as well as by the ARB. Each adopted emission standard was phased in over time. New engines built in and after 2015 across all horsepower sizes must meet Tier 4 final emission standards. In other words, new manufactured engines cannot exceed the emissions established for Tier 4 final emissions standards.

State

California Air Quality Control Plan (State Implementation Plan)

An SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The SIP for the State of California is administered by the ARB, which has overall responsibility for Statewide air quality maintenance and air pollution prevention. California's SIP incorporates individual federal attainment plans for regional air districts—an air district prepares their federal attainment plan, which is sent to the ARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

Areas designated nonattainment must develop air quality plans and regulations to achieve standards by specified dates, depending on the severity of the exceedances. For much of the country, implementation of federal motor vehicle standards and compliance with federal permitting requirements for industrial sources are adequate to attain air quality standards on schedule. For many areas of California, however, additional State and local regulation is required to achieve the standards.

California Clean Air Act

The California Legislature enacted the California Clean Air Act (CCAA) in 1988 to address air quality issues of concern not adequately addressed by the federal CAA at the time. California's air quality problems were and continue to be some of the most severe in the nation, and required additional actions beyond the federal mandates. The ARB administers CAAQS for the 10 air pollutants designated in the CCAA. The 10 State air pollutants are the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The EPA authorized California to adopt its own regulations for motor vehicles and other sources that are more stringent than similar federal regulations implementing the CAA. Generally, the planning requirements of the CCAA are less stringent than the federal CAA; therefore, consistency with the CAA will also demonstrate consistency with the CCAA.

Other ARB responsibilities include but are not limited to overseeing local air district compliance with California and federal laws; approving local air quality plans; submitting SIPs to EPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

California Health and Safety Code Section 39655 and California Code of Regulations Title 17 Section 93000 (Substances Identified as Toxic Air Contaminants)

The ARB identifies substances as TACs as defined in Health and Safety Code Section 39655 and listed in Title 17, Section 93000 of the California Code of Regulations, "Substances Identified As Toxic Air Contaminants." A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there are thresholds set by regulatory agencies below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards. According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs for the State of California can be attributed to relatively few compounds, the most important of which is DPM from diesel-fueled engines.

California Low-emission Vehicle Program

The ARB first adopted Low-Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the State's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, the more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 State Implementation Plan. In 2012, the ARB adopted the LEV III amendments to California's LEV regulations. These amendments, also known as the Advanced Clean Car Program include more stringent emission standards for model years 2017 through 2025 for both criteria pollutants and greenhouse gas (GHG) emissions for new passenger vehicles.[4]

California On-road Heavy-duty Vehicle Program

The ARB has adopted standards for emissions from various types of new on-road heavy-duty vehicles. Section 1956.8, Title 13, California Code of Regulations contains California's emission standards for on-road heavy-duty engines and vehicles, and test procedures. The ARB has also adopted programs to reduce emissions from in-use heavy-duty vehicles including the Heavy-Duty Diesel Vehicle Idling Reduction Program, the Heavy-Duty Diesel In-Use Compliance Program, the Public Bus Fleet Rule and Engine Standards, and the School Bus Program and others.[5]

California In-use Off-road Diesel Vehicle Regulation

On July 26, 2007, the ARB adopted a regulation to reduce DPM and NO_X emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale.

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4 California Air Resources Board (ARB). 2013. Clean Car Standards—Pavley, Assembly Bill 1493. Website: http://www.arb.ca.gov/cc/ccms/ccms.htm. Accessed February 14, 2017.

5 California Air Resources Board (ARB). 2013. The California Almanac of Air Quality and Emissions—2013 Edition. Website: http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed February 14, 2017.

Performance requirements of the rule are based on a fleet's average NO_X emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements, making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

The latest amendments to the Truck and Bus regulation became effective on December 31, 2014. The amended regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent.

The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks.[6]

California Airborne Toxics Control Measure for Asbestos

The ARB has adopted Airborne Toxics Control Measures for sources that emit a particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

In July 2001, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of Best Management Practices (BMPs) to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. The measure establishes specific testing, notification and engineering controls prior to grading, quarrying, or surface mining in construction zones where naturally occurring asbestos is located on projects of any size. There are additional notification and engineering controls at work sites larger than one acre in size. These projects require the submittal of a "Dust Mitigation Plan" and approval by the air district prior to the start of a project.

Construction sometimes requires the demolition of existing buildings where construction occurs. Buildings often include materials containing asbestos, and the project involves the demolition of existing buildings totaling approximately 14,100 square feet. BAAQMD Regulation 11 Rule 2 controls emissions from demolition and renovation of buildings and structures that may contain asbestos, and the manufacture of materials known to contain asbestos.

Asbestos is also found in a natural state, known as naturally occurring asbestos. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers into the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that

6 California Air Resources Board (ARB). 2015. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed March 14, 2019.

has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

The ARB has an Air Toxics Control Measure for construction, grading, quarrying, and surface mining operations, requiring the implementation of mitigation measures to minimize emissions of asbestos-laden dust. The measure applies to road construction and maintenance, construction and grading operations, and quarries and surface mines when the activity occurs in an area where naturally occurring asbestos is likely to be found. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The measure also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity.

Verified Diesel Emission Control Strategies

The EPA's and ARB's tiered off-road emission standards only apply to new engines and off-road equipment can last several years. The ARB has developed Verified Diesel Emission Control Strategies (VDECS), which are devices, systems, or strategies used to achieve the highest level of pollution control from existing off-road vehicles, to help reduce emissions from existing engines. VDECS are designed primarily for the reduction of diesel PM emissions and have been verified by the ARB. There are three levels of VDECS, the most effective of which is the Level 3 VDECS. Tier 4 engines are not required to install VDECS because they already meet the emissions standards for lower tiered equipment with installed controls.

California Diesel Risk Reduction Plan

The ARB Diesel Risk Reduction Plan has led to the adoption of new State regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce DPM emissions by about 90 percent overall from year 2000 levels. The projected emission benefits associated with the full implementation of this plan, including federal measures, are reductions in DPM emissions and associated cancer risks of 75 percent by 2010, and 85 percent by 2020.[7]

Tanner Air Toxics Act and Air Toxics Hot Spots Information and Assessment Act

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), also known as the Hot Spots Act. To date, the ARB has identified more than 21 TACs, and has adopted the EPA's list of Hazardous Air Pollutants as TACs.

Carl Moyer Memorial Air Quality Standards Attainment Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program), a partnership between the ARB and local air districts, issues grants to replace or retrofit older engines

[7] California Air Resources Board (ARB). 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles. Website: http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed March 14, 2019.

and equipment with engines and equipment that exceed current regulatory requirements to reduce air pollution. Money collected through the Carl Moyer Program complements California's regulatory program by providing incentives to effect early or extra emission reductions, especially from emission sources in environmental justice communities and areas disproportionately affected by air pollution. The program has established guidelines and criteria for the funding of emissions reduction projects. Within the SFBAAB, BAAQMD administers the Carl Moyer Program. The program establishes cost-effectiveness criteria for funding emission reductions projects, which under the final 2017 Carl Moyer Program Guidelines are $30,000 per weighted ton of NO_X, ROG, and PM.[8]

Regional

BAAQMD California Environmental Quality Act Air Quality Guidelines

BAAQMD is the primary agency responsible for ensuring that air quality standards (NAAQS and CAAQS) are attained and maintained in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. BAAQMD prepares ozone attainment plans for the national ozone standard, clean air plans for the California standard, and PM plans to fulfill federal air quality planning requirements. BAAQMD also inspects stationary sources of air pollution; responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the Clean Air Act, the Clean Air Act Amendments of 1990, and the California Clean Air Act.

BAAQMD developed quantitative thresholds of significance for its California Environmental Quality Act (CEQA) Guidelines in 2010, which were also included in its updated 2011 Guidelines. BAAQMD's adoption of the 2010 thresholds of significance was later challenged in court. In an opinion issued on December 17, 2015, related to the BAAQMD CEQA Guidelines, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards. The Supreme Court also found that CEQA requires the analysis of exposing people to environmental hazards in specific circumstances, including the location of development near airports, schools near sources of toxic contamination, and certain exemptions for infill and workforce housing. The Supreme Court also held that public agencies remain free to voluntarily conduct this analysis not required by CEQA for their own public projects (CBIA v. BAAQMD (2016) 2 Cal.App.5th 1067, 1083).

In view of the Supreme Court's opinion, BAAQMD published a new version of its CEQA Guidelines in May 2017. The BAAQMD CEQA Guidelines state that local agencies may rely on thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts. BAAQMD's guidelines for implementation of the thresholds are for informational purposes only, to assist local agencies.

8 California Air Resources Board (ARB). 2017. 2017 Carl Moyer Program Guidelines. Website: https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm. Accessed June 2, 2018.

BAAQMD Particulate Matter Plan

To fulfill federal air quality planning requirements, BAAQMD adopted a $PM_{2.5}$ emissions inventory for year 2010 at a public hearing on November 7, 2012. The Bay Area Clean Air Plan also included several measures for reducing PM emissions from stationary sources and wood burning. On January 9, 2013, EPA issued a final rule determining that the Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS, suspending federal SIP planning requirements for the SFBAAB.[9] Despite this EPA action, the SFBAAB will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until the BAAQMD submits a redesignation request and a maintenance plan to the EPA, and the EPA approves the proposed redesignation.

The Air Basin is designated nonattainment for the State PM_{10} and $PM_{2.5}$ standards, but it is currently unclassified for the federal PM_{10} standard and nonattainment for federal $PM_{2.5}$ standards. The EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006, and designated the Air Basin as nonattainment for the new $PM_{2.5}$ standard effective December 14, 2009.

On December 8, 2011, the ARB submitted a "clean data finding" request to the EPA on behalf of the Bay Area. If the clean data finding request is approved, then EPA guidelines provide that the region can fulfill federal $PM_{2.5}$ SIP requirements by preparing either a redesignation request and a $PM_{2.5}$ maintenance plan, or a "clean data" SIP submittal. Because peak $PM_{2.5}$ levels can vary from year to year based on natural, short-term changes in weather conditions, the BAAQMD believes that it would be premature to submit a redesignation request and $PM_{2.5}$ maintenance plan at this time. Therefore, the BAAQMD will prepare a "clean data" SIP to address the required elements, including:

- An emission inventory for primary $PM_{2.5}$, as well as precursors to secondary PM formation
- Amendments to the BAAQMD's New Source Review regulation to address $PM_{2.5}$

BAAQMD 2017 Clean Air Plan

On May 2017, the BAAQMD adopted the final Bay Area 2017 Clean Air Plan. The 2017 Clean Air Plan was prepared by the BAAQMD in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The goals of the 2017 Clean Air Plan are to reduce regional air pollutants and climate pollutants to improve the health of Bay Area residents for the next decades. The 2017 Clean Air Plan aims to lead the region into a post-carbon economy, continue progress toward attaining all state and federal air quality standards, and eliminate health risk disparities from air pollution exposure in Bay Area communities. The Plan includes 85 distinct control measures to help the region reduce air pollutants and has a long-term strategic vision that forecasts what a clean air Bay Area will look like in year 2050. The 2017 Clean Air Plan envisions a future where by the year 2050:

- Buildings will be energy efficient—heated, cooled and powered by renewable energy.

[9] United States Environmental Protection Agency (EPA). 2013. Federal Register. Determination of Attainment for the San Francisco Bay Area Nonattainment Area for the 2006 Fine Particle Standard; California; Determination Regarding Applicability of Clean Air Act Requirements. Website: https://www.federalregister.gov/documents/2013/01/09/2013-00170/determination-of-attainment-for-the-san-francisco-bay-area-nonattainment-area-for-the-2006-fine. Accessed June 5, 2018.

- Transportation will be a combination of electric vehicles, both shared and privately owned; autonomous public transit fleets; with a large share of trips by bicycling, walking, and transit.
- The Bay Area will be powered by clean, renewable electricity and will be a leading incubator and producer of clean energy technologies leading the world in the carbon-efficiency of our products.
- Bay Area residents will have developed a low-carbon lifestyle by driving electric vehicles, living in zero net energy homes, eating low-carbon foods and purchasing goods and services with low carbon content.
- Waste will be greatly reduced, waste products will be re-used or recycled and all organic waste will be composted and put to productive use.

The focus of control measures includes aggressively targeting the largest source of GHG, ozone pollutants and particulate matter emissions—transportation. This includes more incentives for electric vehicle infrastructure, off-road electrification projects such as Caltrain and shore power at ports, and reducing emissions from trucks, school buses, marine vessels, locomotives and off-road equipment. Additionally, the Air District will continue to work with regional and local governments to reduce vehicle miles traveled through the further funding of rideshare, bike and shuttle programs.

BAAQMD Regulations

Regulation 2, Rule 5 (New Source Review Permitting)

The BAAQMD regulates backup emergency generators, fire pumps, and other sources of TACs through its New Source Review (Regulation 2, Rule 5) permitting process (BAAQMD 2016).[10] Although emergency generators are intended to be used only during periods of power outages, monthly testing of each generator is required; however, the BAAQMD limits testing to no more than 50 hours per year. Each emergency generator installed is assumed to meet a minimum of Tier 2 emission standards (before control measures). As part of the permitting process, the BAAQMD limits the excess cancer risk from any facility to no more than 10 per 1-million-population for any permits that are applied for within a 2-year period and would require any source that would result in an excess cancer risk greater than 1 per 1 million to install BACT for Toxics.

Regulation 8, Rule 3 (Architectural Coatings)

This rule governs the manufacture, distribution, and sale of architectural coatings and limits the reactive organic gases content in paints and paint solvents. Although this rule does not directly apply to the project, it does dictate the ROG content of paint available for use during the construction.

Regulation 8, Rule 15 (Emulsified and Liquid Asphalts)

Although this rule does not directly apply to the project, it does dictate the reactive organic gases content of asphalt available for use during the construction through regulating the sale and use of asphalt and limits the ROG content in asphalt.

[10] Bay Area Air Quality Management District (BAAQMD). 2016. NSR [New Source Review Permitting]. Website: http://www.baaqmd.gov/permits/permitting-manuals/nsr-permitting-guidance. Accessed March 4, 2019.

Regulation 1, Rule 301 (Odorous Emissions)

The BAAQMD is responsible for investigating and controlling odor complaints in the Bay Area. The agency enforces odor control by helping the public to document a public nuisance. Upon receipt of a complaint, the BAAQMD sends an investigator to interview the complainant and to locate the odor source if possible. The BAAQMD typically brings a public nuisance court action when there are a substantial number of confirmed odor events within a 24-hour period. An odor source with five or more confirmed complaints per year averaged over 3 years is considered to have a substantial effect on receptors.

Several BAAQMD regulations and rules apply to odorous emissions. Regulation 1, Rule 301 is the nuisance provision that states that sources cannot emit air contaminants that cause nuisance to a number of persons. Regulation 7 specifies limits for the discharge of odorous substances where the BAAQMD receives complaints from 10 or more complainants within a 90-day period. Among other things, Regulation 7 precludes discharge of an odorous substance that causes the ambient air at or beyond the property line to be odorous after dilution with 4 parts of odor-free air, and specifies maximum limits on the emission of certain odorous compounds.

Plan Bay Area

On July 18, 2013, ABAG and the MTC approved the Plan Bay Area. The Plan Bay Area includes integrated land use and transportation strategies for the region and was developed through OneBayArea, a joint initiative between ABAG, BAAQMD, MTC, and the San Francisco Bay Conservation and Development Commission. The plan's transportation policies focus on maintaining the extensive existing transportation network and utilizing these systems more efficiently to handle density in Bay Area transportation cores.[11] Assumptions for land use development used are taken from local and regional planning documents. Emission forecasts in the Bay Area Clean Air Plan rely on projections of vehicle miles traveled, population, employment, and land use projections made by local jurisdictions during development of Plan Bay Area. The Plan Bay Area 2040 was adopted July 2017 and updates Plan Bay Area.

Plan Bay Area 2040, published by the MTC and ABAG, is a long-range integrated transportation and land use/housing strategy through 2040 for the Bay Area. Plan Bay Area 2040 functions as the sustainable communities' strategy mandated by Senate Bill (SB) 375. As a regional land use plan, Plan Bay Area 2040 aims to reduce per-capita greenhouse gas emissions through the promotion of more compact, mixed-use residential and commercial neighborhoods located near transit. Plan Bay Area 2040 is a limited and focused update that builds upon a growth pattern and strategies developed in the original Plan Bay Area (adopted by MTC in 2013) but with updated planning assumptions that incorporate key economic, demographic, and financial trends from the last four years.

Contra Costa County

Contra Costa County General Plan

The Contra Costa County General Plan establishes goals, objectives, and policies associated with air quality. Those goals and policies that are relevant to this analysis are listed below.

[11] Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC). 2013. Plan Bay Area. Website: https://www.planbayarea.org/previous-plan.

Conservation Element

- **Goal 8-K:** To encourage the use of renewable resources where they are compatible with the maintenance of environmental quality.
- **Goal 8-L:** To reduce energy use in the County to avoid risks of air pollution and energy shortages which could prevent orderly development.
- **Goal 8-AA**: To meet Federal Air Quality Standards for all air pollutants.
- **Goal 8-AB**: To continue to support Federal, State and regional efforts to reduce air pollution in order to protect human and environmental health.
- **Goal 8-AC**: To restore air quality in the area to a more healthful level.
- **Goal 8-AD**: To reduce the percentage of Average Daily Traffic (ADT) trips occurring at peak hours.
- **Policy 8-101**: A safe, convenient and effective bicycle and trail system shall be created and maintained to encourage increased bicycle use and walking as alternatives to driving.
- **Policy 8-102**: A safe and convenient pedestrian system shall be created and maintained in order to encourage walking as an alternative to driving.
- **Policy 8-107**: New housing in infill and peripheral areas which are adjacent to existing residential development shall be encouraged.

Transportation and Circulation Element

- **Goal 5-D**: To maintain and improve air quality above air quality standards.
- **Goal 5-I**: To encourage use of transit.
- **Goal 5-J**: To reduce single-occupant auto commuting and encourage walking and bicycling.
- **Goal 5-L**: To reduce GHG emissions from transportation sources through provision of transit, bicycle, and pedestrian facilities.
- **Policy 5-3**: Transportation facilities serving new urban development shall be linked to and compatible with existing and planned roads, bicycle facilities, pedestrian facilities and pathways of adjoining areas, and such facilities shall use presently available public and semi-public rights of way where feasible.
- **Policy 5-23**: All efforts to develop alternative transportation systems to reduce peak period traffic congestion shall be encouraged.
- **Policy 5-24**: Use of alternative forms of transportation, such as transit, bike and pedestrian modes, shall be encouraged in order to provide basic accessibility to those without access to a personal automobile and to help minimize automobile congestion and air pollution.
- **Policy 5-25**: Improvement of public transit shall be encouraged to provide for increased use of local, commuter and intercity public transportation.

3.2.4 - Impacts and Mitigation Measures

Significance Criteria

According to 2019 CEQA Guidelines Appendix G, to determine whether impacts related to air quality are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) 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?

c) Expose sensitive receptors to substantial pollutant concentrations?

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Approach to Analysis

Emission factors represent the emission rate of a pollutant over a given time or activity; for example, grams of NO_X per vehicle mile traveled (VMT) or grams of NO_X per horsepower hour of equipment operation. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. Activity levels are a measure of how active a piece of equipment is and can be represented as the amount of material processed, elapsed time that a piece of equipment is in operation, horsepower of a piece of equipment used, or VMT per day. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) version 2016.3.2 was developed in collaboration with the South Coast Air Quality Management District and other air districts throughout the State. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant emissions associated with construction and operation from a variety of land uses.

The modeling follows BAAQMD guidance where applicable from its CEQA Air Quality Guidelines. The models used in this analysis are summarized as follows:

- Construction criteria pollutant and precursor emissions: CalEEMod, version 2016.3.2
- Operational criteria pollutant and precursor emissions: CalEEMod, version 2016.3.2
- Construction TAC emission air dispersion assessment: EPA AERMOD dispersion model, version 18081

The following criteria air pollutants and precursors are assessed in this analysis:

- Reactive organic gases (ROG)
- Nitrogen oxides (NO_X)
- Carbon monoxide (CO)
- Particulate matter less than 10 microns in diameter (PM_{10})
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)

Note that the project would emit ozone precursors ROG and NO_X. However, the project would not directly emit ozone, since it is formed in the atmosphere during the photochemical reactions of the ozone precursors.

Construction-related Criteria Pollutants

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from both on-site and off-site activities. On-site emissions consist of exhaust emissions from the activity levels of heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Additionally, paving operations and application of architectural coatings would release ROG emissions. Off-site emissions result from motor vehicle exhaust from delivery vehicles, worker traffic and road dust (PM_{10} and $PM_{2.5}$).

Schedule

The project would construct multi-family housing, an enclosed parking structure, and the necessary utility and roadway infrastructure. Construction was assumed to take place 5 days per week and 8 hours per day from July 2020 to July 2022. Construction activities would include demolition, site preparation, grading, building construction, paving, architectural coating. Additional grading and paving would be associated with the additional 0.15 acre of asphalt paving for roadway improvements along Del Hombre Lane and Honey Trail. The construction start date, total construction duration, and construction equipment usage were adjusted to match estimates provided by the project applicant. The construction schedule used to estimate emissions is shown in Table 3.2-7.

Table 3.2-7: Conceptual Construction Schedule

Construction Activity	Conceptual Construction Schedule		Working Days
	Start Date	End Date	
Demolition	7/13/2020	8/23/2020	30
Site Preparation	8/24/2020	9/20/2020	20
Grading	9/21/2020	1/10/2021	80
Building Construction	1/11/2021	5/8/2022	345
Architectural Coating	2/14/2022	6/5/2022	80
Paving	6/6/2022	7/3/2022	20
Off-site Roadway Improvements Grading	6/6/2022	6/14/2022	7
Source: FirstCarbon Solutions (FCS) and CalEEMod, based on project-specific information (Appendix B).			

Equipment Tiers and Emission Factors

Equipment tiers refer to a generation of emission standards established by the EPA and ARB that apply to diesel engines in off-road equipment. The "tier" of an engine depends on the model year and horsepower rating; generally, the newer a piece of equipment is, the greater the tier it is likely to have. Excluding engines greater than 750 horsepower, Tier 1 engines were manufactured generally between 1996 and 2003. Tier 2 engines were manufactured between 2001 and 2007. Tier 3 engines were manufactured between 2006 and 2011. Tier 4 engines are the newest and some incorporate hybrid electric technology; they were manufactured after 2007.

Construction emissions are generally calculated as the product of an activity factor and an emission factor. The activity factor for construction equipment is a measure of how active a piece of equipment is and can be represented as the amount of material processed, elapsed time that a piece of equipment is in operation, horsepower of a piece of equipment used, or the amount of fuel consumed in a given amount of time. The emission factor relates the process activity to the amount of pollutant emitted. Examples of emission factors include grams of emissions per miles traveled and grams of emissions per horsepower-hour. The operation of a piece of equipment is tempered by its load factor which is the average power of a given piece of equipment while in operation compared with its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continually operates at its maximum operating capacity. This analysis uses the CalEEMod default load factors for off-road equipment.

On-site Off-road Equipment

CalEEMod contains built-in inventories of construction equipment for a variety of land use construction projects that incorporate estimates of the number of equipment, their age, their horsepower, and emission control equipment tier mix from which rates of emissions are developed. These inventories were developed based on construction surveys for several land use projects. Table 3.2-8 presents the construction equipment used on the project as derived from CalEEMod. The CalEEMod default emission control equipment tier mix was used in this analysis for the estimation of unmitigated emissions from on-site diesel construction equipment. The construction equipment types and hours per day were adjusted to match expected construction equipment usage provided by the applicant.

Table 3.2-8: Project Construction Equipment Assumptions

Phase Name	Working Days per Phase	Equipment	Number of Pieces of Equipment	Hours per Phase per Piece of Equipment	Average Hours per Day per Piece of Equipment	Horsepower	Load Factor
Demolition	30	Concrete/Industrial Saws	1	57	1.90	81	0.73
		Excavators	1	57	1.90	158	0.38
		Tractors/Loaders/Backhoes	3	30	1.00	97	0.37
Site Preparation	20	Graders	1	80	4.00	187	0.41
		Tractors/Loaders/Backhoes	1	70	3.50	97	0.37
Grading	80	Excavators	1	480	6.00	158	0.38
		Off-Highway Trucks	1	240	3.00	402	0.38
		Tractors/Loaders/Backhoes	2	312	3.90	97	0.37
Building Construction	345	Cranes[1]	1	2,760	8.00	231	0.29
		Forklifts[2]	1	2,415	7.00	89	0.20
		Welders	1	449	1.30	46	0.45
Architectural Coating	80	Aerial Lifts	1	80	1.00	63	0.31
		Air Compressors	5	360	4.50	78	0.48

Table 3.2-8 (cont.): Project Construction Equipment Assumptions

Phase Name	Working Days per Phase	Equipment	Number of Pieces of Equipment	Hours per Phase per Piece of Equipment	Average Hours per Day per Piece of Equipment	Horsepower	Load Factor
Paving	20	Pavers	1	40	2.00	130	0.42
		Paving Equipment	1	40	2.00	132	0.36
		Rollers	1	16	0.80	80	0.38
		Tractors/Loaders/Backhoes	1	32	1.60	97	0.37
Off-site Roadway Improvements	7	Concrete/Industrial Saws	1	16	8	81	0.73
		Rubber Tired Dozers	1	2	1	247	0.40
		Tractors/Loaders/Backhoes	2	12	6	97	0.37
		Cement and Mortar Mixers	4	30	6	9	0.56
		Pavers	1	35	7	130	0.42
		Rollers	1	35	7	80	0.38
		Tractors/Loaders/Backhoes	1	35	7	97	0.37

Notes:
[1] Consistent with the applicant-provided construction equipment list, the crane was assumed to be electric.
[2] The forklift used during the building construction phase is anticipated to be powered by liquid propane or compressed natural gas rather than default assumption of diesel.
Source: Appendix B.

Demolition, Site Preparation, and Grading

The project site is currently occupied by two existing single-story residences and associated accessory structures. To clear the site to allow for the construction of the proposed apartment building, the project includes demolition of the existing residential buildings totaling approximately 3,350 square feet and the removal of hardscape totaling approximately 1,000 square feet. Trips associated with demolition were included in the estimation of emissions, as shown below in Table 3.2-9.

During grading activities, fugitive dust can be generated from the movement of dirt on the project site. CalEEMod estimates dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading dirt into haul trucks. Each activity is calculated differently in CalEEMod, based on the number of acres traversed by the grading equipment.

Only some pieces of equipment are assumed to generate fugitive dust in CalEEMod. The CalEEMod model manual identifies various equipment and the acreage disturbed in an 8-hour day for each piece of equipment:

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

Approximately 29,000 cubic yards of material would be exported during construction of the project. The haul trucks required to export this amount of soil were incorporated into the emission calculation, as shown below in Table 3.2-9.

Off-site On-road Vehicle Trips

The CalEEMod defaults were retained for the parameters related to construction off-site trips. Additional vendor trips were added to the grading and paving phases to account for additional off-site emissions from water trucks during the grading phase and cement trucks during the paving phase. CalEEMod default values include a worker trip length of 10.8 miles, a vendor trip length of 7.3 miles, and a hauling trip length of 20 miles. A summary of the construction-related trips is shown in Table 3.2-9.

Table 3.2-9: Construction Off-site Trips

Activity	Construction Trips per Day		Total Construction Trips
	Worker	Vendor	Haul
Demolition	13	0	4
Site Preparation	5	0	0
Grading	10	6	3,675
Building Construction	277	59	0
Architectural Coating	55	0	0
Paving	10	6	0
Off-site Roadway Improvements	28	0	0
Source: Appendix B.			

Off-Gassing Materials

Asphalt paving and architectural coating materials used during construction would generate off-gas emissions of ROGs. The data collection process determined the acres of asphalt paving required, which CalEEMod uses to determine associated ROG emissions. CalEEMod contains assumptions for application of architectural coatings that are based on the land use type and square footage of the buildings to be constructed and were used to quantify emissions.

Operation-related Criteria Pollutants

Operational emissions were analyzed assuming full-buildout of the project in 2022, which is the earliest year of project operations based on the conceptual construction schedule presented above in Table 3.2-7.

On-road Motor Vehicles

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the project site. The mobile source emissions from the project depend on a number of factors including the number of trips a project would generate each day among other factors including trip distances and types of trips, and vehicle class (cars vs. trucks). Trip generation rates used in estimating mobile-source emissions were consistent with those presented in the Del Hombre Apartments Transportation Impact Assessment (TIA) prepared by Fehr & Peers. As detailed in the TIA, the project is expected to generate approximately 1,800 net daily vehicle trips. The vehicle trips estimated for the project includes a 20-percent reduction based on the project's proximity to existing transit and pedestrian pathways and five-percent increase to account for Transportation Company use. The CalEEMod trip purposes (e.g., primary, pass-by) and default round trip lengths for an urban setting for Contra Costa County were used in this analysis. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline and diesel-powered vehicles). The CalEEMod default vehicle fleet mix for Contra Costa County was used for this analysis.

Architectural Coatings

Paints release VOC/ROG emissions during application and drying. The buildings in the project would be repainted on occasion. Based on CalEEMod defaults, it is assumed that the buildings would be recoated once every 10 years. The project is required to comply with the BAAQMD Regulation 8, Rule 3—Architectural Coatings. This rule governs the manufacture, distribution, and sale of architectural coatings and limits the ROG content in paints and paint solvents.

Consumer Products

Consumer products are various solvents used in non-industrial applications, which emit VOCs during their product use. "Consumer Product" means a chemically formulated product used by household and institutional consumers, including but not limited to: detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. It does not include other paint products, furniture coatings, or architectural coatings.[12] The default emission factor developed for CalEEMod was used.

Landscape Equipment

CalEEMod was used to estimate the landscaping equipment emissions using the default assumptions in the model.

Electricity

Electricity used by the project (for lighting, etc.) would result in emissions from the power plants that would generate electricity distributed on the electrical power grid. Off-site electricity emissions estimates are more pertinent to the analysis of GHG emissions.

Natural Gas

The project would generate emissions from the combustion of natural gas for water heaters, heat, etc. CalEEMod has two categories for natural gas consumption: Title 24 and non-Title 24. The Title 24 uses are defined as the major building envelope systems covered by California's Building Code

[12] California Air Resources Board (ARB). 2011. Regulation for Reducing Emissions from Consumer Products. Website: www.arb.ca.gov /consprod/regs/fro%20consumer%20products%20regulation.pdf. Accessed March 14, 2019.

Title 24 Part 6, such as space heating, space cooling, water heating, and ventilation. CalEEMod defaults were used.

Construction- and Operation-related Toxic Air Contaminants

TACs are air pollutants in miniscule amounts in the air that, if a person is exposed to them, could increase the chances of experiencing health problems. Exposures to TAC emissions can have both chronic long-term (over a year or longer) and acute short-term (over a period of hours) health impacts. Construction-period TAC emissions could contribute to increased health risks to nearby residents or sensitive receptors.

An assessment was made of the potential health impacts to surrounding sensitive receptors resulting from TAC emissions during project construction. The TACs of greatest concern are those that cause serious health problems or affect many people. Health problems can include cancer, respiratory irritation, nervous system problems, and birth defects. Some health problems occur soon after a person inhales TACs. These immediate effects may be minor, such as watery eyes; or they may be serious, such as life-threatening lung damage. Other health problems may not appear until many months or years after a person's first exposure to the TAC. Cancer is one example of a delayed health problem.

Fine particle pollution or $PM_{2.5}$ describes particulate matter that is 2.5 micrometers in diameter and smaller—one-thirtieth the diameter of a human hair. Fine particle pollution can be emitted directly or formed secondarily in the atmosphere. $PM_{2.5}$ health impacts are important because their size can be deposited deeply in the lungs causing respiratory effects.

For purposes of this analysis, exhaust emissions of DPM, are represented as exhaust emissions of $PM_{2.5}$. Studies indicate that DPM poses the greatest health risk among airborne TACs. A 10-year research program conducted by the ARB demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic long-term health risk. DPM differs from other TACs in that it is not a single substance but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Odors

The impact analysis qualitatively evaluates the types of land uses proposed to evaluate whether major sources of anticipated odors would be present and, if so, whether those sources would likely generate objectionable odors. According to the BAAQMD's CEQA Air Quality Guidelines, a project that involves the siting of a new odor source would consider the screening level distances and the complaint history of the odor sources, described below. Projects that would site a new odor source farther than the screening-level distances provided in Table 3.2-10 would not likely result in a significant odor impact.

Table 3.2-10: BAAQMD Odor Screening-level Distances Thresholds

Land Use/Type of Operation	Project Screening Distance
Wastewater Treatment Plant	2 miles
Wastewater Pumping Facilities	1 mile
Sanitary Landfill	2 miles
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	2 miles
Chemical Manufacturing	2 miles
Fiberglass Manufacturing	1 mile
Painting/Coating Operations	1 mile
Rendering Plant	2 miles
Coffee Roaster	1 mile
Food Processing Facility	1 mile
Confined Animal Facility/Feed Lot/Dairy	1 mile
Green Waste and Recycling Operations	1 mile
Metal Smelting Plants	2 mile
Source: Bay Area Air Quality Management District (BAAQMD) 2017.	

Specific Thresholds of Significance

Consistency with Air Quality Plan

The applicable air quality plan is BAAQMD's 2017 Bay Area Clean Air Plan, which identifies measures to:

- Reduce emissions and reduce ambient concentrations of air pollutants;
- Safeguard public health by reducing exposure to the air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and
- Reduce GHG emissions to protect the climate.

A project would be determined to conflict with or obstruct implementation of an applicable air quality plan if it would result in substantial new regional emissions not foreseen in the air quality planning process.

Ambient Air Quality

Where available, the significance thresholds established by the applicable air quality management or air pollution control district may be relied upon to make the significance determinations. While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to CEQA Guidelines Section 15064(b), the BAAQMD recommends that its quantitative and qualitative air pollution thresholds be used to determine the significance of project-related emissions.

In June 2010, BAAQMD adopted thresholds of significance to assist lead agencies in the review of projects under CEQA. These thresholds (see Table 3.2-11) were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and included in the BAAQMD's current CEQA Guidelines (updated May 2017).[13]

Table 3.2-11: BAAQMD Thresholds of Significance

Pollutant	Construction Thresholds Average Daily Emissions	Operational Thresholds	
		Average Daily Emissions	Annual Average Emissions
Criteria Air Pollutants			
ROG	54 pounds/day	54 pounds/day	10 tons/year
NO_X	54 pounds/day	54 pounds/day	10 tons/year
PM_{10}	82 pounds/day	82 pounds/day	15 tons/year
$PM_{2.5}$	54 pounds/day	54 pounds/day	10 tons/year
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other BMPs	Not Applicable	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	10 per one million	10 per one million	
Chronic or Acute Hazard Index	1.0	1.0	
Incremental annual average $PM_{2.5}$	0.3 µg/m³	0.3 µg/m³	
Health Risks and Hazards for Sensitive Receptors (Cumulative from All Sources within 1,000-Foot Zone of Influence) and Cumulative Thresholds for New Sources			
Excess Cancer Risk	100 per 1 million		
Chronic Hazard Index	10.0		
Annual Average $PM_{2.5}$	0.8 µg/m³		

[13] Bay Area Air Quality Management District (BAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed March 14, 2017.

Table 3.2-11 (cont.): BAAQMD Thresholds of Significance

Pollutant	Construction Thresholds Average Daily Emissions	Operational Thresholds	
		Average Daily Emissions	Annual Average Emissions
Accidental Release of Acutely Hazardous Air Pollutants			
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials locating near receptors or new receptors locating near stored or used acutely hazardous materials considered significant	
Notes: ROG = reactive organic gases NO_X = nitrogen oxides PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 µm or less $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5 µm or less Source: Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may 2017-pdf.pdf?la=en. Accessed March 14, 2017.			

Air Quality-related Health Risk

The air quality-related health risk significance thresholds utilized for this assessment were derived from the BAAQMD significance thresholds as project-specific thresholds. These thresholds are:

- Cancer Risk: 10 in one million
- Non-cancer Hazard Index: 1.0
- Annual $PM_{2.5}$: 0.3 µg/m^3

Odors

The significance thresholds for odor impacts are qualitative in nature. Specifically, an odor-generating source with five or more confirmed complaints in the new source area per year averaged over three years is considered to have a significant impact on receptors within the screening distances shown above under Approach to Analysis.

Impact Evaluation

Air Quality Management Plan Consistency

Impact AIR-1: **The project would not conflict with or obstruct implementation of the applicable air quality plan.**

Construction and Operation

The SFBAAB is designated as a nonattainment area for State standards for 1-hour and 8-hour ozone, 24-hour PM_{10}, annual PM_{10}, and annual $PM_{2.5}$ and nonattainment for the national ozone and $PM_{2.5}$ standards.[14] To address regional air quality standards, the BAAQMD has adopted several air quality

[14] Bay Area Air Quality Management District (BAAQMD). 2017. Air Quality Standards and Attainment Status. January. Website: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed March 5, 2019.

policies and plans, and in April 2017, the BAAQMD adopted their 2017 Clean Air Plan,[15] which serves as the regional Air Quality Plan for the Air Basin for attaining federal ambient air quality standards. A project would be determined to conflict with or obstruct implementation of a regional air quality plan if it would result in substantial new regional emissions not foreseen in the air quality planning process. Regional emissions forecasts in the air quality plan are based on population and employment forecasts included in City and County General Plans.

As discussed in Section 3.10, Land Use and Planning, the Contra Costa County General Plan designates the project site as Multiple-Family Residential-Very High Density (MV). Pursuant to the General Plan Land Use Element, the MV designation allows between 30.0 and 44.9 multiple-family units per acre. Proposed land uses consist of multiple-family residences including apartments and condominiums as well as accessory buildings and structures ancillary to the primary uses. The project is requesting an amendment to the Contra Costa County General Plan to re-designate the project site from MV to Multiple-Family Residential-Very Special High (MS) that would allow between 45.0 and 99.9 multiple-family units per acre. Although the project includes an amendment to the Contra Costa County General Plan, the project would be consistent with the suburban, transit-oriented residential character of the surrounding area and the residential density envisioned in the Contra Costa County General Plan.

As discussed in Section 3.12, Population and Housing, the project would not result in substantial population, housing, or employment growth in excess of that analyzed for the Contra Costa County planning area and anticipated under local and regional projections for Contra Costa County. As such, the project would not result in a substantial unplanned increase in population, employment, or associated regional growth in terms of vehicle miles traveled, so it would not conflict with or obstruct implementation of the Air Quality Plan. Therefore, the impact related to air quality management plan consistency would be less than significant.

Level of Significance

Less Than Significant

Cumulative Criteria Pollutant Emissions

Impact AIR-2:	**The project could result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or State ambient air quality standard.**

Impact Analysis

In developing thresholds of significance for criteria air pollutants, the BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively significant. As such, if a project exceeds the identified thresholds of significance, its emissions would be significant in terms of both project- and cumulative-level impacts, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Thus, this impact analysis and discussion is related to the project- and cumulative-level effect of the project's regional criteria air pollutant emissions.

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[15] Bay Area Air Quality Management District (BAAQMD). 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed March 14, 2017.

The region is non-attainment for the federal and State ozone standards, the State PM_{10} standards, and the federal and State $PM_{2.5}$ standards. Potential impacts would result in exceedances of State or federal standards for NO_X or particulate matter (PM_{10} and $PM_{2.5}$). NO_X emissions are of concern because of potential health impacts from exposure to NO_X emissions during both construction and operation and as a precursor in the formation of airborne ozone. PM_{10} and $PM_{2.5}$ are of concern during construction, because of the potential to emit exhaust emissions from the operation of off-road construction equipment and fugitive dust during earth-disturbing activities (construction fugitive dust).

ROG emissions are also important, because of their participation in the formation of airborne ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children.

By its nature, air pollution is largely a cumulative impact resulting from emissions generated over a large geographic region. The nonattainment status of regional pollutants is a result of past and present development within the air basin, and this regional impact is a cumulative impact. In other words, new development projects (such as the project) within the air basin would contribute to this impact only on a cumulative basis. No single project would be sufficient in size, by itself, to result in nonattainment of regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively significant when taken in combination with past, present, and future development projects.

The cumulative analysis focuses on whether a specific project would result in cumulatively significant emissions. According to Section 15064(h)(4) of the CEQA Guidelines, the existence of significant cumulative impacts caused by other projects alone does not constitute substantial evidence that the project's incremental effects would be cumulatively significant. Rather, the determination of cumulative air quality impacts for construction and operational emissions is based on whether the project would result in regional emissions that exceed the BAAQMD regional thresholds of significance for construction and operations on a project level. The thresholds of significance represent the allowable amount of emissions each project can generate without generating a cumulatively significant contribution to regional air quality impacts. Therefore, a project that would not exceed the BAAQMD thresholds of significance on the project level also would not be considered to result in a cumulatively significant impact with regard to regional air quality and would not be considered to result in a significant impact related to cumulative regional air quality.

Construction

During construction, fugitive dust (PM_{10} and $PM_{2.5}$) would be generated from site grading and other earth-moving activities. The majority of this fugitive dust would remain localized and would be deposited near the project site. However, the potential for impacts from fugitive dust exists unless control measures are implemented to reduce the emissions from this source. Exhaust emissions would also be generated from the operation of the off-road construction equipment, as shown in Table 3.2-12 and Table 3.2-13.

Construction Fugitive Dust

Project construction would require general site clearing and grading/earthwork activities. Emissions from construction activities are generally short-term in duration, but may still cause adverse air quality impacts. The project would generate emissions from construction equipment exhaust, worker travel, and fugitive dust as PM_{10} and $PM_{2.5}$. PM is of concern during construction because of the potential to emit fugitive dust during earth-disturbing activities (construction fugitive dust). During construction, fugitive dust (PM) would be generated from site grading and other earth-moving activities. The majority of this fugitive dust would remain localized and would be deposited near the project site.

The BAAQMD does not have a quantitative significance threshold for fugitive dust. BAAQMD's Air Quality Guidelines recommend that projects determine the significance for fugitive dust through application of BMPs. The project does not currently include any dust control measures, resulting in the potential for a significant impact. As such, this represents a potentially significant cumulative construction impact related to criteria air pollutant emissions.

However, per Mitigation Measure (MM) AIR-2, the fugitive dust control measures identified in the BAAQMD's Air Quality Guidelines would be required to be implemented during construction in order to reduce localized dust impacts. Therefore, with implementation of MM AIR-2, cumulative construction impacts associated with violating an air quality standard or contributing substantially to an existing or projected air quality violation in terms of criteria air pollutant emissions specific to fugitive dust would be less than significant with mitigation.

Construction Emissions: ROG, NO_X, PM_{10}, $PM_{2.5}$

As described above under Approach to Analysis, CalEEMod was used to estimate the project's construction emissions. Estimated construction emissions are compared with the applicable thresholds of significance established by the BAAQMD to assess ROG, NO_X, exhaust PM_{10}, and exhaust $PM_{2.5}$ construction emissions to determine significance for this criterion.

As shown in Table 3.2-8, construction of the project was assumed to begin in July 2020 and conclude in July of 2022 based on the tentative construction schedule provided by the project applicant. Construction emissions would likely decrease because of improvements in technology and more stringent regulatory requirements if the construction schedule moves to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required by CEQA Guidelines. The construction emissions modeling parameters and assumptions are summarized above under Approach to Analysis, as the complete modeling results are provided in Appendix B. Annual construction emissions are shown by source in Table 3.2-12, while average daily construction emissions are compared with the applicable significance thresholds in Table 3.2-13.

Table 3.2-12: Annual Construction Emissions (Unmitigated)

Construction Activity	Emissions (Tons/Year)			
	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
2020 Construction Emissions	0.05	0.82	0.02	0.02
2021 Construction Emissions	0.15	1.04	0.01	0.01
2022 Construction Emissions	3.12	0.59	0.02	0.02
Total Construction Emissions (2019–2020)	**3.32**	**2.45**	**0.04**	**0.04**

Notes:
ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns in diameter
$PM_{2.5}$ = particulate matter 2.5 microns in diameter
All construction equipment other than cranes and forklifts were assumed to be diesel-powered. Consistent with applicant-provided information, it was assumed that cranes would be powered by electricity, and forklifts would be powered by liquid propane or compressed natural gas.
Unrounded numbers from the CalEEMod output were used for all calculations.
Source: CalEEMod Output (see Appendix B).

Table 3.2-13: Average Daily Construction Emissions (Unmitigated)

Parameter	Air Pollutants			
	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
Total Emissions (tons/year)	3.32	2.45	0.04	0.04
Total Emissions (lbs/year)	6,630	4,895	81	78
Average Daily Emissions (lbs/day)[1]	12.87	9.50	0.16	0.15
Significance Threshold (lbs/day)	**54**	**54**	**82**	**54**
Exceeds Significance Threshold?	No	No	No	No

Notes:
[1] Calculated by dividing the total lbs by the total 515 working days of construction for the duration of construction (2020–2022).
Calculations use unrounded totals.
lbs = pounds ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns in diameter
$PM_{2.5}$ = particulate matter 2.5 microns in diameter
Source: CalEEMod Output (see Appendix B).

As shown in Table 3.2-13, combined construction emissions from all construction activities are below the recommended thresholds of significance in regards to ROG, NO_X, exhaust PM_{10}, and exhaust $PM_{2.5}$. Therefore, cumulative construction impacts associated with violating an air quality standard or contributing substantially to an existing or projected air quality violation in terms of criteria air pollutant emissions specific to ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be less than significant.

Operational

Operational Emissions: ROG, NO_X, PM_{10}, $PM_{2.5}$

Operational pollutants of concern during operations include ROG, NO_X, PM_{10}, and $PM_{2.5}$. Operations were analyzed assuming full-buildout in 2022. Assumptions used to estimate operational emissions were consistent with those presented in the Del Hombre Apartments TIA prepared by Fehr & Peers. Consistent with the traffic study, the baseline vehicle trips and associated emissions were assumed to be zero. The CalEEMod default trip lengths for an urban setting in Contra Costa County were used in this analysis of vehicle emissions. The major sources for operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ are described above in Approach to Analysis. The project operational emissions for the respective pollutants were calculated using CalEEMod version 2016.3.2. The results for the annual emissions from project operations are presented in Table 3.2-14, while estimated maximum daily emissions are shown in Table 3.2-15.

Table 3.2-14: Annual Operational Emissions (Unmitigated)

Emissions Source	Tons per Year			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	2.04	0.03	0.01	0.01
Energy	0.01	0.11	0.01	0.01
Mobile	0.44	2.03	1.55	0.43
Estimated Annual Emissions	2.50	2.18	1.57	0.45
Thresholds of Significance	**10**	**10**	**15**	**10**
Exceeds Significance Threshold?	No	No	No	No

Notes:
ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
Source: CalEEMod Output (see Appendix B).

Table 3.2-15: Maximum Daily Operational Emissions (Unmitigated)

Emissions Source	Pounds per Day			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	11.65	1.10	0.20	0.20
Energy	0.07	0.63	0.05	0.05
Mobile	3.20	12.55	9.73	2.66
Estimated Maximum Daily Project Emissions	14.92	14.27	9.98	2.91
Thresholds of Significance	**54**	**54**	**82**	**54**
Exceeds Significance Threshold?	No	No	No	No

Table 3.2-15 (cont.): Maximum Daily Operational Emissions (Unmitigated)

Emissions Source	Pounds per Day			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Notes: ROG = reactive organic gases NO_X = nitrous oxides PM_{10} = particulate matter 10 microns or less in diameter $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter The highest daily project emissions occurred in the winter run for NO_X, PM_{10}, and $PM_{2.5}$. The highest ROG emissions occurred in the summer run. Calculations use unrounded results. Source: CalEEMod Output (see Appendix B).				

As shown in Table 3.2-14 and Table 3.2-15, the project would not result in operational-related air pollutants or precursors that would exceed BAAQMD's thresholds of significance, indicating that on-going project operations would not be considered to have the potential to generate a significant quantity of air pollutants. Therefore, cumulative operational impacts associated with violating an air quality standard or contributing substantially to an existing or projected air quality violation in terms of criteria air pollutant emissions would be less than significant.

Level of Significance

Potentially Significant

Mitigation Measures

MM AIR-2 Implement BAAQMD Best Management Practices (BMP) During Construction

During construction, the following BMPs, as recommended by the BAAQMD, shall be implemented:

- Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or more as needed.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks shall be paved as soon as possible.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations. Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact both at Contra Costa County and at the office of the General Contractor regarding dust complaints. This person shall respond and take corrective action within 2 business days of a complaint or issue notification. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Level of Significance After Mitigation

Less Than Significant with Mitigation

Sensitive Receptors Exposure to Toxic Air Contaminant Concentrations

Impact AIR-3:	**The project would expose sensitive receptors to substantial pollutant concentrations.**

This impact addresses whether the project would expose air pollution sensitive receptors to TACs such as construction-related asbestos during disturbance, construction-generated fugitive dust (PM_{10} and $PM_{2.5}$), construction-related TACs, construction-generated DPM, operational-related TACs, or operational CO hotspots. The modeling assumptions and methodology for the construction health risk assessment are provided in Appendix B.

As a residential project, the project itself would be considered a sensitive receptor once operational. The project site is surrounded by existing residences to the north, east, and south of the project site. The closest off-site air pollution sensitive receptors in the vicinity of the project site include multi-family apartments adjacent to and east of the project site.

Construction

Construction Asbestos Exposure

Asbestos from Demolition

Structures to be demolished sometimes contain asbestos-containing materials (ACM). The project site is currently occupied by two existing single-story residences (3018 Del Hombre Lane and 112 Roble Road) and associated accessory structures that would be demolished as part of the project. Demolition of existing buildings and structures would be subject to BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). BAAQMD Regulation 11, Rule 2 is intended to limit asbestos emissions from demolition or renovation of structure and the associated disturbance of ACM generated or handled during these activities. The rule addresses the national emissions standards for asbestos along with some additional requirements. The rule requires the Lead Agency and its contractors to notify BAAQMD of any regulated renovation or demolition activity. This notification includes a description of structures and methods utilized to determine whether ACMs are potentially present. All ACM found on-site must be removed prior to demolition or renovation activity in accordance with BAAQMD Regulation 11, Rule 2, including specific requirements for surveying, notification, removal, and disposal of ACMs. Therefore, projects that comply with BAAQMD Regulation 11, Rule 2 would ensure that ACM would be removed and disposed of appropriately and safely. By complying with BAAQMD Regulation 11, Rule 2, thereby minimizing the release of airborne asbestos emissions, demolition activity would not result in a significant impact to air quality.

Naturally Occurring Asbestos

The California Department of Conservation Division of Mine Reclamation (DMR) published a guide for generally identifying areas that are likely to contain naturally occurring asbestos. The associated California Geological Survey map indicates that there are several locations within Contra Costa County that are likely to contain naturally occurring asbestos; however, none of these sites are located within a 1-mile vicinity of the project site.[16] Therefore, it can be reasonably concluded that the project would not expose sensitive receptors to naturally occurring asbestos during project construction. Impacts would be less than significant.

Construction Fugitive Dust

Activities associated with earth-moving activities and construction would generate short-term emissions of fugitive dust resulting in increased dust fall and locally elevated levels of PM_{10} and $PM_{2.5}$ downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties. As addressed under Impact AIR-2, MM AIR-2 is included to ensure that the BAAQMD BMPs would be implemented to reduce fugitive dust emissions from construction activities to less than significant. Implementation of AIR-2 would ensure impacts related to generation of localized fugitive dust during construction of the project would be less than significant with mitigation.

Project-specific Construction TACs

A Health Risk Assessment (HRA) is a guide that helps to determine whether current or future exposures to a chemical or substance in the environment could affect the health of a population. In general, risk depends on the following factors:

- Identify the TACs that may be present in the air;
- Estimate the amount of TACs released from all sources, or the source of particular concern, using air samples or emission models;
- Estimate concentrations of TACs in air in the geographic area of concern by using dispersion models with information about emissions, source locations, weather, and other factors; and
- Estimate the number of people exposed to different concentrations of the TAC at different geographic locations.

During construction, the project would result in the emissions of TACs that could potentially impact nearby sensitive receptors. TACs are the air pollutants of most concern as it relates to sensitive receptors, as they have the greatest potential to pose a carcinogenic and non-carcinogenic (such as asthma and bronchitis) hazard to human health. The BAAQMD has defined health risk significance thresholds as discussed under Specific Thresholds of Significance above. These thresholds are represented as a cancer risk to the public and a non-cancer hazard from exposures to TACs. Cancer

[16] California Department of Conservation, Division of Mine Reclamation. 2000. A General Location Guide for Ultramafic Rocks in California—Areas More likely to Contain Naturally Occurring Asbestos. August. Website: https://www.conservation.ca.gov/cgs/Pages/HazardousMinerals/asbestos2.aspx. Accessed February 27, 2019.

risk represents the probability (in terms of risk per million individuals) that an individual would contract cancer resulting from exposure to TACs continuously over a period of several years.

Construction DPM Emissions

The DPM construction emissions (as $PM_{2.5}$ exhaust emissions) were estimated using CalEEMod version 2016.3.2. The on-site DPM emissions were generated by off-road construction equipment. The off-site DPM emissions were generated by trips associated with the hauling of material, vendor trips, and worker vehicle traffic. Table 3.2-16 summarizes annual construction $PM_{2.5}$ emissions without and the application of mitigation.

Table 3.2-16: Project DPM (as $PM_{2.5}$ Exhaust) Construction Emissions

Scenarios	On-site DPM (grams/sec)	Road Segment 1 Off-site $PM_{2.5}$ DPM (grams/sec)	Road Segment 2 Off-site $PM_{2.5}$ DPM (grams/sec)	Road Segment 3 Off-site $PM_{2.5}$ DPM (grams/sec)	Road Segment 4 Off-site $PM_{2.5}$ DPM (grams/sec)
Annual Average Construction Emissions (Unmitigated)					
Unmitigated	1.996E-03	4.964E-06	4.525E-06	6.179E-06	5.428E-06
Annual Average Construction Emissions (Mitigated—Tier IV Interim Equipment)					
Mitigated	3.851E-04	4.964E-06	4.525E-06	6.179E-06	5.428E-06
Source: Appendix B.					

Air Dispersion Modeling Results

An air dispersion model is a mathematical formulation used to estimate the air quality impacts at specific locations (receptors) surrounding a source of emissions given the rate of emissions and prevailing meteorological conditions. The air dispersion model applied in this assessment was the EPA AERMOD (version 18081) air dispersion model that is approved by the BAAQMD for air dispersion assessments. Specifically, the AERMOD model was used to estimate levels of air emissions at sensitive receptor locations from the project's construction $PM_{2.5}$ exhaust and $PM_{2.5}$ total ($PM_{2.5}$ exhaust and $PM_{2.5}$ fugitive dust combined). The use of the AERMOD model provides a refined methodology for estimating construction impacts by utilizing long-term, measured representative meteorological data for the project site and a representative construction schedule.

The urban dispersion option was used to describe the air dispersion in the local vicinity of the project site. The air dispersion model assessment used meteorological data from the Metropolitan Oakland International Airport, which is approximately 17 miles southwest of the project site. The working schedule was assumed to be 8 hours per day and 5 days per week.

Receptor locations within the AERMOD model were placed at locations of existing residences surrounding the project site. To evaluate the project's localized construction impacts, sensitive receptor height should be taken into account at the point of maximum impact. The BAAQMD does not provide the recommended receptor height. However, the California Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments recommends selecting a receptor height from zero meters to 1.8 meters, which will result in the highest predicted downwind concentration. A receptor height of zero meters was used to evaluate the project's localized construction impacts. Consistent with information provided by the project applicant, it was assumed that the project would be fully constructed before project operations would commence; therefore, no receptors were placed at the project site to assess construction impacts.

The generation of on-site construction DPM emissions (as $PM_{2.5}$ exhaust) from the on-site construction equipment was represented in AERMOD as a construction area source. The emissions from the on-site construction exhaust source were assumed to be emitted at a height of five meters above ground to account for the top of the equipment exhaust stack where the emissions are released to the atmosphere and the increase in the height of the emissions due to its heated exhaust. The off-site construction vehicle emissions were also included in the assessment and were represented in the AERMOD model as a line volume source with a release height of 3.1 meters.

Estimation of Cancer Risks

The BAAQMD has developed a set of guidelines for estimating cancer risks that provide adjustment factors that emphasize the increased sensitivities and susceptibility of young children to exposures to TACs.[17] These adjustment factors include age-sensitivity weighting factors, age-specific daily breathing rates, and age-specific time-at-home factors. The recommend method for the estimation of cancer risk for off-site sensitive receptors is shown in the equations below with the cancer risk adjustment factors provided in Table 3.2-17 for various sensitive/residential receptors (infant, child, and adult) over the construction period. A lifetime exposure is assumed over the time from the 3rd trimester of pregnancy to the duration of the construction.

$$\text{Cancer Risk} = C_{DPM} \times \text{Inhalation Exposure Factor}$$

Where:

Cancer Risk = Total individual excess cancer risk defined as the cancer risk a hypothetical individual faces if exposed to carcinogenic emissions from a particular source for specified exposure durations; this risk is defined as an excess risk because it is above and beyond the background cancer risk to the population; cancer risk is expressed in terms of risk per million exposed individuals.

C_{DPM} = Period average DPM air concentration calculated from the air dispersion model in $\mu g/m^3$

Inhalation is the most important exposure pathway to impact human health from DPM and the inhalation exposure factor is defined as follows:

$$\text{Inhalation Exposure Factor} = CPF \times EF \times ED\ AAF/AT$$

17 Bay Area Air Quality Management District (BAAQMD). 2016. Air Toxics New Source Review Program Health Risk Assessment (HRA) Guidelines. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en.

Where:

CPF = Inhalation cancer potency factor for the TAC: 1.1 $(mg/kg\text{-}day)^{-1}$ for DPM
EF = Exposure frequency (days/year)
ED = Exposure duration (years of construction)
AAF = set of age-specific adjustment factors that include age sensitivity factors (ASF), daily breathing rates (DBR), and time at home factors (TAH)—Table 3.2-17
AT = Averaging time period over which exposure is averaged (days)

The OEHHA-recommended values for the various cancer risk parameters shown in the equation above are provided in Table 3.2-17.

Table 3.2-17: BAAQMD Exposure Assumptions for Cancer Risk during Construction

Receptor Type	Exposure Frequency		Exposure Duration (years)	Age Sensitivity Factors	Time at Home Factor (%)	Daily Breathing Rate[1] (l/kg-day)
	Hours/day	Days/year				
Sensitive/Residential—Infant						
3rd Trimester	24	350	0.25	10	85	361
0–2 years	24	350	1.72	10	85	1,090
Sensitive Receptor—Child						
3–16 years	24	350	1.97	3	72	572
Sensitive Receptor—Adult						
> 16 to 30 years	24	350	1.97	1	73	261

Notes:
(1) The daily breathing rates recommended by the BAAQMD for sensitive/residential receptors assume the 95th percentile breathing rates for all individuals less than 2 years of age and 80th percentile breathing rates for all older individuals.
(l/kg-day) = liters per kilogram body weight per day
Source: BAAQMD 2016.

Estimation of Non-cancer Hazards

An evaluation of the potential non-cancer effects of chronic chemical exposures was also conducted. Adverse health effects are evaluated by comparing the annual receptor concentration of each chemical compound with the appropriate Reference Exposure Level (REL). Available RELs promulgated by the OEHHA were considered in the assessment.

Risk characterization for non-cancer health hazards from TACs is expressed as a hazard index (HI). The HI is a ratio of the predicted concentration of the project's emissions to a concentration considered acceptable to public health professionals, termed the REL.

To quantify non-carcinogenic impacts, the hazard index approach was used.

$$HI = C_{ann}/REL \qquad \text{(EQ-3)}$$

Where:

HI = chronic hazard index
C_{ann} = annual average concentration of TAC as derived from the air dispersion model (µg/m^3)
REL = reference exposure level above which a significant impact is assumed to occur (µg/m^3)

The hazard index assumes that chronic exposures to TACs adversely affect a specific organ or organ system (toxicological endpoint) of the body. For each discrete chemical exposure, target organs presented in regulatory guidance were used. To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity REL. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds 1, a health hazard is presumed to exist. For purposes of this assessment, the TAC of concern is DPM, for which the OEHHA has defined a REL for DPM of 5 µg/m^3. The principal toxicological endpoint assumed in this assessment was through inhalation.

Estimation of $PM_{2.5}$ Hazards

The BAAQMD's guidance also includes a significance threshold for $PM_{2.5}$ based on studies that show health impacts from exposure to this pollutant. Construction emissions of $PM_{2.5}$ were represented in this assessment as total $PM_{2.5}$, which included DPM (as $PM_{2.5}$ exhaust) and fugitive dust $PM_{2.5}$ combined.

Estimates of Health Risks and Hazards from Project Construction

The estimated health and hazard impacts at the Maximum Impacted Sensitive Receptor (MIR) from the project's construction emissions are provided in Table 3.2-18. The MIR was determined to be located within the multi-family residences adjacent to the project site; specifically, the MIR is located east of the eastern border of the project site off Roble Road. The estimates shown in Table 3.2-18 include application of BMPs recommended by the BAAQMD, as required by MM AIR-2.

Table 3.2-18: Estimated Health Risks and Hazards during Construction (Unmitigated Equipment)

Source	Cancer Risk (risk per million)	Chronic Non-Cancer Hazard Index(2)	Annual $PM_{2.5}$ Concentration (µg/m^3)
Risks and Hazards at the MIR: Infant(1)	19.7	0.02	0.08
Risks and Hazards at the MIR: Child(1)	2.9	0.02	0.08
Risks and Hazards at the MIR: Adult(1)	0.4	0.02	0.08
BAAQMD Thresholds of Significance	**10**	**1**	**0.30**
Exceeds Individual Source Threshold?	**Yes**	**No**	**No**

Notes:
MIR = maximum impacted sensitive receptor
(1) The MIR is an existing dwelling unit within the multi-family residences, located adjacent to the project site to the east and off Roble Road.
(2) Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 µg/m^3.
Source: Appendix B.

As shown above in Table 3.2-18, the cancer risks for adults and children, the chronic non-cancer hazard index, and the annual $PM_{2.5}$ concentration at the MIR would not exceed the BAAQMD's recommended thresholds of significance; however, the cancer risk for infants at the MIR would exceed the applicable threshold of significance. Therefore, MM AIR-3 is required to reduce the potential cancer risk impact. MM AIR-3 requires that the applicant provide documentation to the Contra Costa County that all off-road diesel-powered construction equipment greater than 50 horsepower meets EPA or ARB Tier IV Interim off-road emissions standards. Tier IV standards require that NO_X and PM emission rates (grams per brake horsepower-hour), the prime targets of the federal "Tier" regulations, be reduced by approximately 90 percent compared to Tier III emission standards.[18]

Table 3.2-19 summarizes the project's estimated cancer risk, hazard index, and $PM_{2.5}$ concentration impacts at the MIR from the project's construction emissions after incorporation of MM AIR-2 and MM AIR-3.

Table 3.2-19: Estimated Health Risks and Hazards during Construction (Mitigated)

Source	Cancer Risk (risk per million)	Chronic Non-Cancer Hazard Index[(2)]	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Risks and Hazards at the MIR: Infant[(1)]	3.8	0.003	0.02
Risks and Hazards at the MIR: Child[(1)]	0.6	0.003	0.02
Risks and Hazards at the MIR: Adult[(1)]	0.1	0.003	0.02
BAAQMD Thresholds of Significance	**10**	**1**	**0.30**
Exceeds Individual Source Threshold?	**No**	**No**	**No**

Notes:
MIR = maximum impacted sensitive receptor
(1) The MIR is an existing dwelling unit within the multi-family residences located adjacent to the project site to the east and off Roble Road.
(2) Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 $\mu g/m^3$.
Source: Appendix B.

As shown in Table 3.2-19, the project's construction emissions would not exceed the any applicable BAAQMD significance thresholds at the MIR after the incorporation of MM AIR-2 and MM AIR-3. Therefore, project-related emissions would not result in significant health impacts to nearby sensitive receptors during construction.

Overall

Overall, the construction-related sensitive receptors exposure to TACs impact would be less than significant with mitigation.

18 California Air Resources Board (ARB). 2018. Non-road Diesel Engine Certification Tier Chart. Website: https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart-pdf.

Operation

Project-specific Operational TACs

The project is residential in nature, and there would be no on-site TAC sources during operation. In addition, the daily vehicle trips generated by the project would be primarily generated by passenger vehicles. Passenger vehicles typically use gasoline engines rather than the diesel engines that are found in heavy-duty trucks. Compared to the combustion of diesel, the combustion of gasoline had relatively low emissions of DPM. Therefore, emissions from vehicles traveling to and from the project site during project operations would not be a considerable source of TACs. Consistent with BAAQMD guidance, this assessment does not provide an operational health risk analysis, and the project would not result in significant health impacts during operation.

Operational CO Hotspots

Localized high levels of CO (CO hotspot) are associated with traffic congestion and idling or slow-moving vehicles. The BAAQMD recommends a screening analysis to determine if a project's operation has the potential to contribute to a CO hotspot. The screening criteria identify when site-specific CO dispersion modeling is not necessary. The project would result in a less than significant impact to air quality for local CO if any of the following screening criteria are met:

- **Screening Criterion 1**: The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans; or
- **Screening Criterion 2:** The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; or
- **Screening Criterion 3:** The 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).

Screening Criterion 1

Contra Costa Transportation Authority (CCTA) serves as the Congestion Management Agency (CMA) for Contra Costa County. As the CMA, CCTA must prepare, per State law, a Congestion Management Program (CMP) and update it every 2 years. The CMP is meant to outline CCTA's strategies for managing the performance of the regional transportation within the County. A CMP must contain several components: traffic level of service standards for State highways and principal arterials; multi-modal performance measures to evaluate current and future systems; a seven-year capital program of projects to maintain or improve the performance of the system or mitigate the regional impacts of land use projects; a program to analyze the impacts of land use decisions; and a travel demand element that promotes transportation alternatives to the single-occupant vehicle. The goal of Contra Costa County is to maintain Level of Service (LOS) D during the peak-hours, however signalized intersections located along the CMP network may operate at LOS F with a volume-to-capacity ratio standard of 1.5 or less. As shown in Section 3.15 Transportation, for Impact TRANS-1 under Opening Year with Project Conditions, the Coggins Drive at Las Juntas Way intersection (Intersection No. 3) is projected to degrade to LOS F in the morning peak-hour, and the addition of project traffic would worsen operations and result in a significant impact. In addition, as shown in

Section 3.15, Transportation, under "Cumulative Impacts," under the Cumulative Year Plus Project scenario, the Coggins Drive at Las Juntas Way intersection (Intersection No. 3) is projected to degrade to LOS F in the morning peak-hour. The addition of project traffic would worsen operations in the AM peak-hour and would also result in LOS E conditions in the PM peak-hour; these conditions represent a significant impact. However, although Intersection No. 3 would not meet the standards of screening Criteria 1, this intersection is consistent with screening Criteria 2 and 3, as discussed below.

Screening Criteria 2 and 3

The project-specific TIA (included as Appendix I) identified peak-hour traffic volumes for ten intersections affected by the project. As identified in the TIA, the maximum peak-hour intersection volume would occur at the Oak Road/Treat Boulevard intersection in the "Cumulative with Project" scenario during the AM peak-hour. The estimated cumulative traffic volume at the Oak Road/Treat Boulevard intersection is 6,374 AM peak-hour trips. This level of peak-hour trips is substantially less than BAAQMD's second and third screening criteria of 44,000 vehicles per hour and 24,000 vehicles per hour respectively. The project would not result in an increase of traffic volumes at affected intersections to more than 44,000 vehicles per hour and would not increase traffic volumes at affected intersections to more than 24,000 where vertical or horizontal mixing is substantially limited; accordingly, the project is consistent with screening Criteria 2 and 3. As noted above, although Intersection No. 3 would not meet the standards of Criteria 1, this intersection would be consistent with screening Criteria 2 and 3.

Therefore, since all intersections of the project would meet the screening Criteria 2 and 3, the project's impact related to air quality for local CO emissions would be less than significant.

Overall

Overall, the operational-related sensitive receptors exposure to TACs impact would be less than significant.

Level of Significance Before Mitigation

Potentially Significant

Mitigation Measures

Implement MM AIR-2 and the following:

MM AIR-3 Use Construction Equipment That Meets Tier IV Interim Off-road Emission Standards

During construction activities, all off-road equipment with diesel engines greater than 50 horsepower shall meet either United States Environmental Protection Agency or California Air Resources Board Tier IV Interim off-road emission standards. The construction contractor shall maintain records concerning its efforts to comply with this requirement, including equipment lists. Off-road equipment descriptions and information may include but are not limited to equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, and engine serial number.

If engines that comply with Tier IV Interim off-road emission standards are not commercially available, then the construction contractor shall use the next cleanest piece of off-road equipment (e.g., Tier III) available. For purposes of this mitigation measure, "commercially available" shall mean the availability of Tier IV Interim engines taking into consideration factors such as (i) critical-path timing of construction; and (ii) geographic proximity to the project site of equipment. The contractor can maintain records for equipment that is not commercially available by obtaining letters from at least two rental companies for each piece of off-road equipment where the Tier IV Interim engine is not available.

Level of Significance After Mitigation

Less than Significant with Mitigation

Objectionable Odors Exposure

Impact AIR-4:	**The project would not result in other emissions (such as those leading to odors adversely affecting a substantial number of people).**

Impact Analysis

Odors can cause a variety of responses. The impact of an odor often results from interacting factors such as frequency (how often), intensity (strength), duration (time), offensiveness (unpleasantness), location, and sensory perception. Two circumstances have the potential to cause odor impacts:

1) A source of odors is proposed to be located near existing or planned receptors; or
2) A receptor land use is proposed near an existing or planned source of odor.

To determine significance for this impact, the first circumstance was applied. BAAQMD's CEQA Air Quality Guidelines provides suggested screening distances for a variety of odor-generating land uses and operations, as shown in Table 3.2-10, which are based on distance between types of sources known to generate odor and the receptor. Projects that would site an odor source or a receptor farther than the applicable screening distance, shown in Table 3.2-10, would not result in a significant odor impact.

Construction

Diesel exhaust and VOCs would be emitted during construction of the project resulting from heavy-duty construction equipment and asphalt paving activities, both of which could be objectionable odors to some populations. However, emissions would disperse rapidly from the site and construction activities would be relatively low in intensity. As such, it is not anticipated that construction-related activities would create objectionable odors affecting a substantial number of people. Therefore, construction odor impacts at existing off-site odor sensitive receptors would be less than significant.

Operation

Operational Odors at Existing Off-site Odor Sensitive Receptors

Land uses considered associated with odors include typically include agricultural operations (dairies, feedlots, etc.), landfills, wastewater treatment plants, refineries, and other types of industrial land uses. The project does not propose any of these types of land uses or other land uses typically associated with emitting objectionable odors (see Table 3.2-10 for land uses typically associated with emitting objectionable odors). During operation of the project, potential sources of odor would primarily consist of vehicles traveling to and from the site. Exhaust from mobile sources are not typically associated with numerous odor complaints but are known to have temporary and less concentrated odors. As such, these occurrences would not produce significant amounts of odors. Therefore, construction odor impacts at existing off-site odor sensitive receptors would be less than significant.

Project Site as an Odor Sensitive Receptor

The project consists of a residential development and would have the potential to place sensitive receptors (residents) near existing or planned sources of odors. The project site is not located within the vicinity of agricultural operations (e.g., dairies, feedlots, etc.), landfills, asphalt batch plants, or chemical manufacturing; however, there are several land uses within the screening distances shown in Table 3.2-10. These land uses include Waste Management Service (located at 2658 North Main Street, Walnut Creek) and four auto-body repair shops that could perform on-site painting/coating operations. The closest of these land uses is Pleasant Hill Collision Repair Center, located approximately 0.50 mile northwest of the project site. Public records requests were filed with the BAAQMD to obtain the most recent odor compliant history for possible sources within the vicinity of the project site. Based on the responses from the BAAQMD Public Records Section, none of potential sources of odor had have received any confirmed complaints over the last ten-year period. Therefore, there are no land uses within the screening distances shown in Table 3.2-10 that have received five or more confirmed complaints per year for any recent 3-year period. The project would not place odor sensitive receptors near an existing or planned source of odor affecting a substantial number of people. Therefore, operational odor impacts in terms of the project site as an odor sensitive receptor would be less than significant.

Level of Significance

Less Than Significant

3.2.5 - Cumulative Impacts

Criteria Pollutants

The BAAQMD considers the emission levels for which a project's individual emissions would be cumulatively significant. As such, if a project exceeds the identified thresholds of significance, its emissions would be significant in terms of both project- and cumulative-level impacts, resulting in significant adverse air quality impacts to the region's existing air quality conditions. As stated in the BAAQMD 2017 CEQA Guidelines, additional analysis to assess cumulative impacts is unnecessary. Rather, the determination of cumulative air quality impacts for construction and operational emissions is based on whether the project would result in regional emissions that exceed BAAQMD regional thresholds of significance for construction and operations on a project level. Projects that generate emissions below the BAAQMD significance thresholds would be considered consistent with regional air quality planning efforts would not generate cumulatively significant emissions. See Impacts AIR-1 and AIR-2 for analysis and discussion of the cumulative air quality management plan consistency and criteria air pollutant emissions impacts. Overall, Impacts AIR-1 and AIR-2 determined that the cumulative construction and operational criteria air pollutant emissions impacts would be less than significant with mitigation.

Toxic Air Contaminants

Construction Emissions at Existing Maximum-impacted Air Pollution Sensitive Receptor

The BAAQMD recommends assessing the potential cumulative impacts from sources of TACs within 1,000 feet of a project site. As a result, a cumulative construction HRA was performed that examined the cumulative impacts of the project's construction emissions and sources of TAC emissions within 1,000 feet of the project site. Based on proximity to the project site, the MIR was determined to be a dwelling unit within the multi-family residences located adjacent to the project site to the east and off Roble Road. Therefore, the cumulative health impacts were estimated at this location.

For a cumulative-level TACs analysis, BAAQMD provides three tools for use in screening potential cumulative sources of TACs. These tools are:

- **Surface Street Screening Tables.** BAAQMD pre-calculated potential cancer risks and $PM_{2.5}$ concentration increases for each county within their jurisdiction for roadways that meet BAAQMD's "major roadway" criteria of 10,000 vehicles or 1,000 trucks per day. Risks are assessed by roadway volume, roadway direction, and distance to sensitive receptors. There is no roadway that generates more than 10,000 trips per day or more than 1,000 trucks per day located within 1,000 feet of project boundary. The segment of Treat Boulevard between Oak Road and Bancroft Road is estimated to accommodate approximately 55,600 average annual average daily trips and is located approximately 850 feet south of the project boundary and 1,000 feet south of the MIR.[19]
- **Freeway Screening Analysis Tool**. BAAQMD prepared a Google Earth file that contains pre-estimated cancer risk, hazard index, and $PM_{2.5}$ concentration increases for highways within the Bay Area. Risks are provided by roadway link and are estimated based on elevation and distance to the sensitive receptor. The Google Earth file does not identify any highways within 1,000 feet of the MIR.
- **Stationary Source Risk and Hazard Screening Tool**. BAAQMD prepared a Google Earth file that contains the locations of all stationary sources within the Bay Area that have BAAQMD permits. For each emissions source, BAAQMD provides conservative cancer risk and $PM_{2.5}$ concentration increase values. There are no stationary sources located within 1,000 feet of project boundary.

[19] City of Walnut Creek. 2010. Traffic Counts, 2010 Traffic Volume Map. Website: http://www.walnut-creek.org/departments/public-works/engineering-services/traffic-engineering/traffic-counts. Accessed February 27, 2019.

Table 3.2-20 summarizes the cumulative health impacts at the MIR during construction of the project. The $PM_{2.5}$ concentration estimate for project construction shown in Table 3.2-20 include application of BMPs recommended by the BAAQMD, as required by MM AIR-2.

Table 3.2-20: Cumulative Construction Air Quality Health Impacts at the MIR (Unmitigated)

Source	Source Type	Distance from MIR (feet) (1)	Cancer Risk (per million)	Chronic Non-Cancer HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Project					
Construction—Unmitigated	Construction Equipment and Construction Vehicle Trips	25	19.70	0.02	0.079
Local Roads (>10,000 Average Daily Trips)					
Treat Boulevard	Local Roadway	1,000	2.21	ND	0.057
Cumulative Health Risks from Project Construction and Existing TAC Sources					
Cumulative Total with Project Construction			21.9	0.02	0.1
BAAQMD Cumulative Thresholds of Significance			**100**	**10**	**0.8**
Threshold Exceedance?			**No**	**No**	**No**

Notes:
(1) The MIR is an existing dwelling unit within the multi-family residences, located adjacent to the project site to the east and off Roble Road.
MIR = maximum impacted sensitive receptor
ND = no data available
Source: Appendix B.

As noted in Table 3.2-20 above, the cumulative health impacts at the MIR from existing TAC emission sources located within 1,000 feet combined with the project's construction-related emissions would not exceed the BAAQMD's recommended cumulative significance thresholds for cancer risk, chronic non-cancer HI, or $PM_{2.5}$ concentration. Therefore, the cumulative construction TACs exposure impact would be less than significant with the incorporation of MM AIR-2.

The mitigation measures identified to reduce the project-level TACs impact cancer risk impacts would further reduce the cumulative-level TACs impact. Cumulative Impacts at the MIR with implementation of MM AIR-2 and MM AIR-3 are summarized in Table 3.2-21.

Table 3.2-21: Cumulative Construction Air Quality Health Impacts at the MIR (Mitigated)

Source	Source Type	Distance from MIR (feet) [(1)]	Cancer Risk (per million)	Chronic Non-Cancer HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Project					
Construction—Mitigated	Construction Equipment and Construction Vehicle Trips	25	3.81	0.003	0.017
Local Roads (>10,000 Average Daily Trips)					
Treat Boulevard	Local Roadway	1,000	2.21	ND	0.057
Cumulative Health Risks from Project Construction and Existing TAC Sources					
Cumulative Total with Project Construction			6.0	0.00	0.1
BAAQMD Cumulative Thresholds of Significance			**100**	**10**	**0.8**
Threshold Exceedance?			**No**	**No**	**No**

Notes:
(1) The MIR is an existing dwelling unit within the multi-family residences, located adjacent to the project site to the east and off Roble Road.
MIR = maximum impacted sensitive receptor
ND = no data available
Source: Appendix B.

Operational Emissions at Project Site as an Air Pollution Sensitive Receptor

When siting a new sensitive receptor (such as a residential land uses), BAAQMD recommends that the analysis include an evaluation of TACs that could adversely affect individuals within the planned project. Therefore, the BAAQMD screening analysis was applied at the project site for conditions at project build-out.

The three BAAQMD-provided tools for use in screening potential sources of TACs are assessed below:

- **Surface Street Screening Tables.** BAAQMD pre-calculated potential cancer risks and $PM_{2.5}$ concentration increases for each county within their jurisdiction for roadways that meet BAAQMD's "major roadway" criteria of 10,000 vehicles or 1,000 trucks per day. Risks are assessed by roadway volume, roadway direction, and distance to sensitive receptors. The segment of Treat Boulevard between Oak Road and Bancroft Road is estimated to accommodate approximately 55,600 average annual average daily trips and is located approximately 850 feet south of the project boundary.[20]

[20] City of Walnut Creek. 2010. Traffic Counts, 2010 Traffic Volume Map. Website: http://www.walnut-creek.org/departments/public-works/engineering-services/traffic-engineering/traffic-counts. Accessed February 27, 2019.

- **Freeway Screening Analysis Tool**. BAAQMD prepared a Google Earth file that contains pre-estimated cancer risk, hazard index, and $PM_{2.5}$ concentration increases for highways within the Bay Area. Risks are provided by roadway link and are estimated based on elevation and distance to the sensitive receptor. There are no freeways or major highways within 1,000 feet of the project boundary.
- **Stationary Source Risk and Hazard Screening Tool**. BAAQMD prepared a Google Earth file that contains the locations of all stationary sources within the Bay Area that have BAAQMD permits. For each emissions source, BAAQMD provides conservative cancer risk and $PM_{2.5}$ concentration increase values. There are no stationary sources located within 1,000 feet of project boundary.

Table 3.2-22 summarizes the cumulative health impacts at the project site at project buildout.

Table 3.2-22: Cumulative Operational Air Quality Health Impacts at the Project Site

Source	Source Type	Distance from Project Site (feet)	Cancer Risk (per million)	Chronic Non-Cancer HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Local Roads (>10,000 Average Daily Trips)					
Treat Boulevard	Local Roadway	850	2.54	ND	0.066
Project-level Health Risks					
Maximum Individual Source			**2.54**	—	**0.06**
BAAQMD Project-level Thresholds of Significance			**10**	**1**	**0.3**
Threshold Exceedance?			**No**	**No**	**No**
Cumulative Health Risks from Project Construction and Existing TAC Sources					
Cumulative Total			**2.54**	—	**0.06**
BAAQMD Cumulative Thresholds of Significance			**100**	**10**	**0.8**
Threshold Exceedance?			**No**	**No**	**No**

Notes:
ND = no data available
Source: Appendix B.

As shown in Table 3.2-22, the cumulative health impacts at the project site from existing TAC emission sources located within 1,000 feet of the project site would not exceed the BAAQMD's cumulative health significance thresholds nor would any one existing source exceed the BAAQMD's project-level health significance thresholds. Therefore, the cumulative operational TACs impacts would be less than significant.

Overall, the cumulative construction and operational TACs impacts would be less than significant with mitigation.

Level of Cumulative Significance Before Mitigation

Potentially Significant

Cumulative Mitigation Measures

Implement MM AIR-2 and MM AIR-3

Level of Cumulative Significance After Mitigation

Less Than Significant with Mitigation