4.2 Air Quality

4.2.1 Introduction

This section addresses the potential for air quality impacts that could result from implementation of the Project, including increases in criteria air pollutants and exposure to substantial pollutant concentrations. This section describes existing air quality, potential short-term construction related impacts, and direct and indirect operational emissions associated with development under the Specific Plan. The analysis of emissions focuses on whether construction or operation of the Project would cause an exceedance of State ambient air quality standards.

This section evaluates and analyzes the potential impacts of Project development on regional and local air quality from both stationary and mobile sources of air emissions. The analysis is consistent with methodologies set forth in the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines. While potential effects of the environment on the Project are arguably not required to be analyzed or mitigated under CEQA, for informational purposes this section nevertheless analyzes potential effects of the air quality environment on development that could occur as a result of the Project as set forth in CEQA *Guidelines*, Appendix G, Significance Criteria, and in order to provide this supplemental information to the public and decision-makers. Mitigation measures are identified to reduce potential impacts to less-than-significant levels. This air quality analysis is closely coordinated with the analysis of potential impacts with regard to greenhouse gases and climate change, which is provided in Section 4.6, *Greenhouse Gas Emissions and Energy*, of this EIR.

4.2.2 Environmental Setting

Physical Setting

Climate and Meteorology

The Project site is located in Contra Costa County, which lies within the San Francisco Bay Area Air Basin (Bay Area Air Basin). The Bay Area Air Basin encompasses the nine-county region including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, San Francisco, Marin and Napa Counties and the southern portions of Solano and Sonoma Counties. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. High-pressure systems are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface and resulting in the formation of subsidence inversions. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During summer and fall, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates, such as sulfates and nitrates.

Specifically, the Project site is located within the Carquinez Strait climatological subregion of the Bay Area Air Basin. This subregion is bound by Rodeo in the southwest, Vallejo in the northwest, Fairfield in the northeast and Brentwood in the southeast. Prevailing winds in this subregion are from the west with some eastward flow during the summer and fall months. Winds are strongest in the afternoon, and wind speeds ranging from 15 to 20 mph are common throughout the strait region. Annual average wind speeds are 8 mph in Martinez, and 9 to 10 mph further east. Temperatures in the subregion range from the maximum summer averages in the 90s and minimum winter averages in the high 30s.

Many industrial facilities with significant air pollutant emissions — e.g., chemical plants and refineries — are located within the Carquinez Strait Region. The pollution potential of this area is often moderated by high wind speeds. However, upsets at industrial facilities can lead to short-term pollution episodes, and emissions of unpleasant odors may occur at any time. Receptors downwind of these facilities could suffer more long-term exposure to air contaminants than individuals elsewhere (BAAQMD, 2017a).

Criteria Air Pollutants

As required by the federal Clean Air Act passed in 1970, the U.S. Environmental Protection Agency (EPA) has identified six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. The U.S. EPA calls these pollutants *criteria air pollutants* because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide ("CO"), nitrogen dioxide, sulfur dioxide, particulate matter ("PM") and lead are the six criteria air pollutants.

Some criteria air pollutants are considered regional in nature, some are considered local and some have characteristics that are both regional and local. Air pollutants are also characterized as "primary" and "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere (such as carbon monoxide, sulfur dioxide, lead particulates and hydrogen sulfide). Secondary pollutants are those formed through chemical reactions in the atmosphere; these chemical reactions usually involve primary pollutants, normal constituents of the atmosphere and other secondary pollutants. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases ("ROG") and nitrogen oxides ("NO_X"). ROG and NO_X are known as precursor compounds for ozone. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production.

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources.

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. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Accordingly, the Project's potential for increasing ozone is measured by assessing its ROG and NO_x emissions.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide ("CO")

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions,[1] CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

Over the past few decades, CO concentrations have declined dramatically in California due to regulatory controls and programs. Most areas of the state, including the region encompassing the Project site, are in full compliance with State and federal CO standards. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, less emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas*, shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican

[1] "Inversion conditions" refer to temperature inversion, whereby cold air lies below warmer air at higher altitudes (i.e., temperature increases with height).

border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels. Nitrogen dioxide is of concern for air quality because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is a major component of the group of gaseous nitrogen compounds commonly referred to as nitrogen oxides (NOx) which also includes nitric oxide (NO). Nitrogen oxides are produced by fuel combustion in motor vehicles, industrial stationary sources (such as refineries and cement kilns), ships, aircraft, and rail transit. Typically, NOx emitted from fuel combustion is in the form of NO and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NOx emitted from the source.

Sulfur Dioxide

Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (both PM_{10} and $PM_{2.5}$) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. In the Bay Area, high concentrations of SO_2 are only a concern in areas close to refinery operations. Its health effects include breathing problems and potential permanent damage to lungs. Sulfur dioxide is an ingredient in acid rain (acid aerosols), which can damage trees, lakes and property. Acid aerosols can also reduce visibility.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns[2] or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because these particles are so small and thus are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health

[2] A micron is one-millionth of a meter.

problems including asthma, bronchitis, and acute and chronic respiratory symptoms such as shortness of breath and painful breathing.

Studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing. Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge, a comprehensive evaluation of research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope, 2006). CARB has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year (CARB, 2002), while achieving the annual ambient air quality standard for $PM_{2.5}$ could reduce premature mortality by 9,300 per year (CARB, 2008).

Lead

Lead has a range of adverse neurotoxic health effects, and was formerly released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. In the Bay Area, high concentrations of lead are only a concern in areas close to general aviation airports. Lead has a range of adverse neurotoxic health effects for which children are at special risk. Some lead-containing chemicals cause cancer in animals.

Existing Air Quality

Criteria Air Pollutants

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants. Existing and probable future levels of air quality in the Project vicinity can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. The station in Martinez at 521 Jones Street is nearest to the Project site (located approximately 3 miles to the northwest); however, this station only monitors sulfur dioxide, which is typically not a pollutant of regional concern in the Bay Area. The 2956-A Treat Boulevard Station in Concord is the second closest station located approximately 6 miles south of the Project site. This station monitors ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM_{10}, and $PM_{2.5}$. This station does not monitor lead, but the Bay Area is in attainment status with state and federal ambient air quality standards for lead. **Table 4.2-1** shows a five-year summary of monitoring data for criteria pollutants from the 2956-A Treat Boulevard station with the exception of sulfur dioxide which was measured from the Martinez station. The table also compares these measured concentrations with state and federal ambient air quality standards.

TABLE 4.2-1
AIR QUALITY DATA SUMMARY (2012–2018) FOR THE PROJECT AREA

	Monitoring Data by Year[e]				
Pollutant	**2014**	**2015**	**2016**	**2017**	**2018**
Ozone					
Highest 1 Hour Average (ppm)[b]	**0.095**	0.088	**0.095**	0.082	0.077
Days over State Standard (0.09 ppm)[a]	1	0	1		0
Highest 8 Hour Average (ppm)[b]	**0.080**	**0.073**	**0.074**	0.070	**0.061**
Days over National Standard (0.075 or 0.070 ppm)[a,c]	2	2	2	0	0
Days over State Standard (0.07 ppm)[a]	2	4	2	0	0
Carbon Monoxide					
Highest 1 Hour Average (ppm)[b]	1.4	1.4	1.2	1.7	1.9
Days over State Standard (20 ppm) or National Standard (35 ppm)[a]	0	0	0	0	0
Highest 8 Hour Average (ppm)[b]	1.1	1.3	1.0	1.3	1.6
Days over National and State Standard (9 ppm)[a]	0	0	0	0	0
Particulate Matter (PM_{10})					
Highest 24 Hour Average ($\mu g/m^3$)[b]	43	24	19	41	**105**
Estimated Days over National Standard (150 $\mu g/m^3$)[a,d]	0	0	0	0	0
Estimated Days over State Standard (50 $\mu g/m^3$)[a,d]	0	0	0	0	6
State Annual Average (State Standard 20 $\mu g/m^3$)[a,b]	14.2	13.1	11.5	13.3	16.3
Particulate Matter ($PM_{2.5}$)					
Highest 24 Hour Average ($\mu g/m3$)[b] –	30.6	31.0	20.7	**89**	**180**
Estimated Days over National Standard (35 $\mu g/m^3$)[a,d]	0	0	0	6	14
State Annual Average (State and National Standard 12 $\mu g/m3$)[b]	6.6	8.8	5.9	12.0	
Nitrogen Dioxide					
Highest 1 Hour Average (ppm)[b]	0.048	0.033	0.016	0.041	0.038
Days over State Standard (0.18 ppm)[a]	0	0	0	0	0
Days over National Standard (0.10 ppm)	0	0	0	0	0
State Annual Average (State Standard 0.03 ppm/National Standard 0.053 ppm)	0.008	0.007	0.005	0.007	0.006
Sulfur Dioxide					
Highest 1 Hour Average (ppm)[b]	0.021	0.015	0.011	0.016	0.025
Days over National Standard (0.075 ppm) or State Standard (0.25 ppm)[a]	0	0	0	0	0
Highest 24 Hour Average (ppm)[b]	0.005	0.005	0.002	0.003	0.004
Days over State Standard (0.04 ppm) or National Standard (0.14 ppm)	0	0	0	0	0

NOTES:

a Generally, state standards and national standards are not to be exceeded more than once per year.
b ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
c In October 2015, the U.S. EPA implemented a new 8-hour ozone standard of 70 ppb. Exceedances in 2015 are based on this standard.
d $PM_{10\ 5}$ is not measured every day of the year.
e Monitoring Data are from BAAQMD's station in Concord with the exception of sulfur dioxide, which was measured BAAQMD's Martinez station.
Values in **Bold** exceed the respective air quality standard.
SOURCE: BAAQMD, 2020.

Table 4.2-1 shows trends in regional exceedances of the federal and state ozone standards. Because of the number of exceedances, ozone is the pollutant of greatest concern in the Bay Area. Bay Area counties experience most ozone exceedances during the period from April through October.

Industrial facilities such as chemical plants and refineries contribute significantly to air pollution in the Carquinez Strait Region. Motor vehicle transportation, including automobiles, trucks, transit buses and other modes of transportation, is also a major contributor to regional air pollution.

The principal sources of ozone precursors ROG and NO_X in the Bay Area include on-road motor vehicles. The Bay Area has a significant motor vehicle population and these reductions are projected as vehicles meeting more stringent emission standards enter the fleet and all vehicles use cleaner burning gasoline and diesel fuel or alternative fuels. This includes the use of improved evaporative emission control systems, computerized fuel injection, engine management systems to meet increasingly stringent California emission standards, cleaner gasoline and the Smog Check program. ROG and NO_X emissions from other mobile sources and stationary sources are also projected to decline as more stringent emission standards and control technologies are adopted and implemented.

Direct emissions of PM_{10} have increased slightly in the Bay Area since 1975 and the trend is projected to continue. This increase is due to growth in emissions from area-wide sources, primarily fugitive dust sources. Emissions of directly emitted $PM_{2.5}$ from diesel motor vehicles have been decreasing since 1990 (due to adoption of more stringent emission standards for vehicle manufacturers) even though population and vehicle miles traveled are growing. As shown in **Table 4.B-3**, PM_{10} concentrations at the Treat Boulevard monitoring station occasionally exceed the 24-hour average state standard. The large exceedance in 2018 is attributable to smoke from wildfire.

The standards for nitrogen dioxide, sulfur dioxide and lead are being met in the Bay Area and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future (ABAG, 2001).

Toxic Air Contaminants

The BAAQMD provides a Google Earth-based inventory of stationary source risks and hazards. This source indicates one permitted TAC source within 1,000 feet of the Project site boundary. (BAAQMD, 2020b). These sources have risks/concentrations calculated in **Table 4.2-2** below.

TABLE 4.2-2
STATIONARY SOURCES OF TACS WITHIN 1,000 FEET OF THE PROJECT SITE

Name of Source	Address	Cancer Risk (in one million)	Chronic Health Index (Unit less ratio value)	$PM_{2.5}$ Concentration (micrograms/ cubic meter)
Central Contra Costa Sanitary District	990 Central Avenue	1.65	0.00	0.0

NOTES:

SOURCE: BAAQMD 2020b

The Project site is also within 0.5 miles from I-680, a high volume roadway and freeway. An active rail line is located along the southern Project border. This railroad is operated by BNSF (FRA, 2017).

Sensitive Land Uses

Some persons are considered more sensitive than others to air pollutants. The reasons for heightened sensitivity may include health problems, proximity to the emissions source and duration of exposure to air pollutants. Land uses such as schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old and the infirm are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on the human respiratory system.

Existing sensitive receptors in the Project area include single family residences to the northwest of the Project site between Palms Drive and Arthur Road and RV Park inhabitants located on the other side of the hill to the northwest. There are also single family residences located to the northwest of the Project site to the west of I-680. In addition, there are single family homes and an RV Park southeast of the railroad tracks that border the Project site.

4.2.3 Regulatory Setting

Regulatory Context for Air Quality

The U.S. EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of *State Implementation Plans*. However, the U.S. EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. In California, CARB is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California State Implementation Plan, securing approval of this plan from the U.S. EPA and identifying toxic air contaminants (“TACs”).

CARB also regulates certain mobile emissions sources in California, such as construction equipment, trucks and automobiles and oversees the activities of air quality management districts, which are organized at the county or regional level. Air quality management districts are primarily responsible for regulating stationary emissions sources at facilities within their geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act (see *Air Quality Plans*, below). The BAAQMD is the regional agency with regulatory authority over emissions sources in the Bay Area, which includes all of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin and Napa counties, the southern half of Sonoma County and the southwestern half of Solano County.

Ambient Air Quality Standards

The Federal Clean Air Act requires the U.S. EPA to identify National Ambient Air Quality Standards (NAAQS or "national standards") to protect public health and welfare. National standards have been established for O_3, CO, NO_2, sulfur dioxide, respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead. Similarly, the State of California has required CARB to identify California Ambient Air Quality Standards (CAAQS) for O_3, CO, NO_2, sulfur dioxide, respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead. **Table 4.2-3** shows current national and State ambient air quality standards, as well as the Bay Area attainment status and common sources for each pollutant.

The ambient air quality standards are intended to protect the public health and welfare and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Attainment Status

Under amendments to the federal Clean Air Act, the U.S. EPA has classified air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. **Table 4.2-3** shows the current attainment status for the State and the Bay Area Air Basin. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment" or "nonattainment" for the state standards. Thus, areas in California have two sets of attainment / non-attainment designations: one set with respect to the national standards and one set with respect to the state standards.

As shown in **Table 4.2-3**, the Bay Area is currently designated "nonattainment" for state and national (1 hour and 8 hour) ozone standards and for the state PM_{10} and $PM_{2.5}$ standards. The Bay Area is designated "attainment" or "unclassified" with respect to the other ambient air quality standards.

Air Quality Plans

The 1977 Federal Clean Air Act amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 California Clean Air Act also requires development of air quality plans and strategies to meet State air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as SIPs, discussed above.

TABLE 4.2-3
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Non-Attainment	0.070 ppm	Marginal Non-Attainment	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.090 ppm	Non-Attainment	---	---	
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9.0 ppm	Attainment (maintenance area)	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.180 ppm	Attainment	0.100 ppm	Unclassified	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment	
Particulate Matter (PM10)	Annual Arithmetic Mean	20 μg/m3	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 μg/m3	Non-Attainment	150 μg/m3	Unclassified	
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 μg/m3	Non-Attainment	12 μg/m3	Unclassified/ Attainment	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	24 hour	---	---	35 μg/m3	Non-Attainment	
Lead	Calendar Quarter	---	---	1.5 μg/m3	Attainment	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 μg/m3	Attainment	---	---	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	No Federal Standard	---	Geothermal Power Plants, Petroleum Production and refining

SOURCE: BAAQMD, 2017b.

The Clean Air Plan for the Bay Area is prepared with the cooperation of the BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). On April 19, 2017, the BAAQMD adopted the most recent revision to the Clean Air Plan, the *Bay Area 2017 Clean Air Plan* (BAAQMD, 2017c). The *Bay Area 2017 Clean Air Plan* serves to:

- Update the most recent Bay Area ozone plan, the *2010 Clean Air Plan*, pursuant to air quality planning requirements defined in the California Health & Safety Code;
- Include all feasible measures to reduce emissions of ozone precursors (ROG and NOx) and reduce transport of ozone and its precursors to neighboring air basins; and
- Build upon and enhance the BAAQMD's efforts to reduce emissions of fine particulate matter and toxic air contaminants.

The 2017 Clean Air Plan includes a wide range of proposed "control measures," or actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent greenhouse gases. Numerous measures reduce multiple pollutants simultaneously: for example, ozone, particulate matter, air toxics, and GHGs. Others focus on a single type of pollutant, such as "super GHGs" – defined as those GHGs with very high global warming potential such as methane – or are progressive actions to remove harmful particles in the air (BAAQMD, 2017c).

Toxic Air Contaminants (TACs)

The ambient background of toxic air contaminants (TACs) is the combined result of many diverse human activities, including gasoline stations, automobiles, dry cleaners, industrial operations, hospital sterilizers, and painting operations. In general, mobile sources contribute more significantly to health risks than do stationary sources. Both BAAQMD and the California Air Resources Board (CARB) operate a network of monitoring stations that measure ambient concentrations of certain TACs that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area, as in all urban areas. Ambient concentrations of TACs are similar throughout the urbanized areas of the Bay Area.

Growing evidence indicates that exposure to emissions from diesel-fueled engines, about 95 percent of which come from diesel-fueled mobile sources, may result in cancer risks that exceed those attributed to other measured TACs. In 1998, the Office of Environmental Health Hazard Assessment (OEHHA) issued a health risk assessment that included estimates of the cancer potency of diesel particulate matter (DPM) (OEHHA, 2009). Because DPM cannot be directly monitored in the ambient air, however, estimates of cancer risk resulting from DPM exposure must be based on concentration estimates made using indirect methods (e.g., derivation from ambient measurements of a surrogate compound).

Asbestos is also a TAC of concern, particularly in association with demolition of older buildings and structures. Asbestos is a fibrous mineral, which is both naturally occurring in ultramafic rock (a rock type commonly found in California) and used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, including

asbestosis and lung cancer, it is strictly regulated based on its natural widespread occurrence and its former use as a building material.

Regulations of Construction Vehicles

On July 26, 2007, CARB adopted new regulations intended to reduce emissions of PM10 and PM2.5 and NOx from certain diesel-powered vehicles by requiring businesses to retrofit or "turnover" their fleets over time (13 California Code of Regulations [CCR] Section 2449). The regulations apply to any person, business or government agency that owns or operates any diesel-powered off-road vehicle in California with 25 or greater horsepower, including vehicles used in construction (i.e., backhoes, tractors).

The emission requirements are intended to require fleets to apply exhaust retrofits that capture pollutants before they are emitted, and to accelerate turnover of fleets to newer, less-polluting engines. “Turnover” means retrofitting an engine to capture pollutants, replacing a dirty engine with a clean engine, retiring a dirty vehicle, replacing a vehicle with a new or used piece, or re-designating a vehicle as “low-use.” “Low-use” vehicles (which operate for less than 100 hours per year) are exempt from emission requirements, but still must be properly labeled and reported to CARB.

Fleets are subject to compliance dates based on fleet size. Fleet size is determined by combined horsepower. Small fleets are those with less than 2,500 hp, medium fleets are those with 2,501 to 5,000 hp, and large fleets are those with over 5,000 hp. For small fleets implementation of regulations did not begin until 2019. Medium fleets began in 2017, while large fleets began in 2014.

In addition, medium and large fleets are banned from adding vehicles with engines that meet only Tier 1 off-road emission standards to their fleets as of January 1, 2014, and small fleets are banned from adding vehicles with engines that meet only Tier 1 off-road emission standards to their fleets as of January 1, 2016. Medium and large fleets are banned from adding vehicles with engines that meet only Tier 2 off-road emission standards to their fleets as of January 1, 2018, and small fleets are banned from adding vehicles with engines that meet only Tier 2 off-road emission standards to their fleets as of January 1, 2023. After these respective dates, fleets may only add vehicles with engines that meet Tier 3 off-road emission standards. For fleets with 500 hp or less, there is an optional compliance schedule which achieves 100% Tier 2 engines by 2029.

BAAQMD Rules, Regulations, and CEQA Guidelines

The BAAQMD is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting stationary sources in the Bay Area. BAAQMD does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various stationary sources, and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but also TACs emissions sources subject to these rules are regulated through the BAAQMD’s permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD

monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the Project would be subject to the BAAQMD Rules and Regulations. Both federal and State ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's Rules and Regulations.

With respect to construction activities associated with Project development, applicable BAAQMD regulations would relate to portable equipment (e.g., concrete batch plants, and gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers, and cranes), architectural coatings, and paving materials. Equipment used during Project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1 (General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings); and BAAQMD Regulation 8 (Organic Compounds), Rule 15 (Emulsified and Liquid Asphalts).

BAAQMD adopted updated *CEQA Air Quality Guidelines* (Guidelines), including new thresholds of significance in June 2010, and revised them in May 2011 (BAAQMD, 2017a). The Guidelines advise lead agencies on how to evaluate potential air quality impacts, including establishing quantitative and qualitative thresholds of significance. The thresholds BAAQMD adopted were called into question by a minute order issued January 9, 2012 in *California Building Industry Association v. BAAQMD,* Alameda Superior Court Case No. RGI0548693. The minute order states that "The Court finds [BAAQMD's adoption of thresholds] is a CEQA Project, the court makes no further findings or rulings." The claims made in the case concerned the CEQA impacts of adopting the thresholds, particularly, how the thresholds would affect land use development patterns. Petitioners argued that the thresholds for Health Risk Assessments encompassed issues not addressed by CEQA. As a result, the BAAQMD resolutions adopting and revising the significance thresholds in 2011 were set aside by a judicial writ of mandate on March 5, 2012. In May of 2012, BAAQMD updated its CEQA Air Quality Guidelines to continue to provide direction on recommended analysis methodologies, but without recommended quantitative significance thresholds. On August 13, 2013, the First District Court of Appeal ordered the trial court to reverse the judgment and upheld the BAAQMD's CEQA thresholds. *California Building Industry Ass'n v. Bay Area Air Quality Mgmt. Dist*., Case No. A135335 & A136212 (Court of Appeal, First District, August 13, 2013).

The California Supreme Court granted review of the appeal, but only to address whether or not CEQA requires an analysis of how existing environmental conditions will impact future residents or users of a proposed project and did not review or address the adequacy of specific thresholds adopted by the BAAQMD in 2011. On December 17, 2015, the Supreme Court concluded that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project's future users or residents, reversing the Court of Appeal's judgment on that issue. The case was the remanded back to the Court of Appeal on August 12, 2016 which concluded that "the challenged thresholds are not invalid on their face, but may not be used for the primary purpose envisioned by District, namely, to routinely assess the effect of

existing environmental conditions on future users or occupants of a project" (CBIA v. BAAQMD [2016] 1 Cal.App.5th 715).

In May 2017, the BAAQMD released an updated version of its *CEQA Air Quality Guidelines* which include revisions made to the 2010 Guidelines to address the California Supreme Court's 2015 opinion in *CBIA v. BAAQMD*. The air quality impact analysis in this EIR uses the adopted thresholds and methodologies from the 2017 BAAQMD *CEQA Air Quality Guidelines* to determine the potential impacts of the Project on the environment. Per the published appellate decision in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, 387, the CEQA does not require an analysis of the existing air pollution sources on a project's future users or future receptors. Contra Costa County General Plan

The Contra Costa County General Plan ("General Plan") Conservation Element (Contra Costa, 2010) contains an Air Quality Resources discussion (Section 8.14) that identifies general goals and policies designed to address air pollution. While the goals and policies apply to development projects throughout the unincorporated County, the majority of them are not directly applicable to the Project because they tend to focus on improvements to the transportation system, reducing long distance commuting, encouraging and supporting non-auto transportation, and reducing future land use conflicts related to air pollution. However, policies directly applicable to the CEQA review of projects are summarized as follows:

- *Policy 8-103:* Mitigation measures are to be imposed when there is a finding that air quality would be significantly affected.
- *Policy 8-104:* Proposed projects should be reviewed for potential to generate hazardous air pollutants.
- *Policy 8-105*: Land uses which are sensitive to air pollution shall be separated from sources of air pollution.
- *Policy 8-106*: Air quality planning efforts shall be coordinated with other local, regional, and State agencies.
- *Policy 8-107*: New housing in infill and peripheral areas which are adjacent to existing residential development shall be encouraged.

Contra Costa County Climate Action Plan

On December 15, 2015, the CCCCAP was approved by the Board of Supervisors. The CCCCAP outlines how the County will achieve the 15 percent below baseline levels by 2020, as per the AB 32 GHG emissions reduction target. Additionally, the CCCCAP aims to support other public health, energy efficiency, water conservation, and air quality goals identified in the County's General Plan and other policy documents. The CCCCAP is a tiered document, which relies on the CEQA and BAAQMD's guidelines for air quality standards, and GHG reduction strategies.

4.2.4 Significance Criteria

Consistent with Appendix G of the CEQA *Guidelines*, the impact of the project on air quality would be considered significant if it would:

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

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

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

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

Analysis Methodology

The thresholds for air quality are based upon the BAAQMD 2017 *CEQA Guidelines and Thresholds*, which does not address outdated references, links, analytical methodologies or other technical information that may be in the Guidelines or the BAAQMD's 2009 *Justification Report* (BAAQMD, 2009), an associated document. The BAAQMD is currently working to update any outdated information in the Guidelines.

Criteria Pollutant Emissions

The potential for Project operations to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the state and federal Clean Air Act emissions limits for stationary sources. To ensure that new stationary sources do not cause or contribute to a violation of a state air quality standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above specified emissions limits (54 pounds per day or 10 tons per year for ozone precursors ROG and NO_x) must offset those emissions (BAAQMD, 2009). To ensure that new stationary sources are consistent with attainment of federal air quality standards, the federal New Source Review program enforces emissions limits for PM_{10} and $PM_{2.5}$ of 15 tons per year (82 pounds per day) and 10 tons per year (54 pounds per day), respectively. These emissions limits represent levels below which a new source is not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants.

Potential impacts are assessed by modeling the estimated daily emissions generated by Project construction and Project operations using the CalEEMod land use emissions model version 2016.3.1. Project emissions are then compared to the significance criteria in the BAAQMD 2017 *CEQA Air Quality Guidelines*, determining whether the Project would:

- Result in total construction emissions of ROG, NOx, or $PM_{2.5}$ (exhaust) of 10 tons per year or greater or 54 pounds per day or greater.

- Exceed a construction emission threshold for PM_{10} (exhaust) of 15 tons per year or greater, or 82 pounds per day or greater.
- Result in total operational emissions of ROG, NOx, or $PM_{2.5}$ of 10 tons per year or greater or 54 pounds per day or greater.
- Exceed an operational emission threshold for PM_{10} of 15 tons per year or greater or 82 pounds per day.
- Result in CO concentrations of 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average) as estimated by roadway vehicle volumes exceeding 44,000 vehicles per hour at any intersection.

For PM_{10} and $PM_{2.5}$ that would be part of fugitive dust generated during construction, the BAAQMD Guidelines specify compliance with Best Management Practices as the threshold.

Per the BAAQMD Guidelines, a project's contribution to cumulative impacts for criteria pollutants is considered significant if the project's impact individually would be significant (i.e., if it exceeds the BAAQMD's quantitative thresholds).

Health Risk Impacts of the Project

The results of the Project-level health risk analysis contained herein are based on a Health Risk Assessment (HRA) conducted to address exposure impacts that would result from construction or operational activities under the Project and presented in Appendix B to this EIR. This analysis assesses the increased cancer risk and localized $PM_{2.5}$ concentrations attributable to the proposed Project at off-site receptors. The proposed Project would be considered to have a significant health risk impact if Project emissions would result in exposure of persons to substantial levels of TAC resulting in (a) an incremental cancer risk level greater than 10 in one million, (b) a noncancerous risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$).

While the BAAQMD 2011 *CEQA Air Quality Guidelines* provided methodology for analysis of potential adverse effects of a project on the environment, potential effects of the environment on a project are generally not required to be analyzed or mitigated under CEQA (*CBIA v. BAAQMD* [2016] 1 Cal.App.5^{th} 715).

Cumulative Criteria Pollutant Emissions

Regarding the assessment of cumulative impacts, a project's contribution to cumulative impacts to regional air quality from emission of criteria air pollutants would be considered cumulatively considerable and significant if the impact individually would be significant (i.e., exceeds the BAAQMD's quantitative thresholds). The BAAQMD's quantitative thresholds are based on the trigger levels for the federal New Source Review Program and BAAQMD's Regulation 2, Rule 2 for new or modified sources. These New Source Review Program rules provide that any new source that will emit pollutants above the levels stated must impose "Best Available Control Technology" (BACT). New Source Review increments were established within federal Clean Air Act programs, aimed at regulating stationary sources of air pollution, and are keyed quantitatively

to an area's air quality designations. For a project or plan that would not result in a significant impact individually, the project or plan contribution to any cumulative impact would be considered less than significant if the project or plan is consistent with the local General Plan and the local general plan is consistent with the applicable regional air quality plan. In this case, the applicable regional air quality plan is the BAAQMD's *Bay Area 2017 Clean Air Plan.*

Cumulative Risk and Hazard Impacts

Cumulative air quality impacts of the Project from exposure to TACs or $PM_{2.5}$ are assessed by evaluating whether the Project's contribution to cancer risk or localized $PM_{2.5}$ concentrations would be cumulatively considerable. For increased cancer risk, a cumulatively considerable contribution would be an incremental increase of 10 in one million. Additionally, a cumulative cancer risk to off-site receptors is estimated by combining the increased risk of the Project with those estimated for other projects proposed within 1,000 feet, as available, and comparing those risks to the 100 in one million cumulative cancer risk developed by the BAAQMD.

For localized $PM_{2.5}$ concentrations, a cumulatively considerable contribution would be an incremental concentration of 0.8 ug/m^3.

Odor Impacts

For odors, BAAQMD recommends that potential impacts be evaluated if a potential source of objectionable odors is proposed at a location near existing sensitive receptors or if sensitive receptors are proposed to be located near an existing source of objectionable odors. The first step in assessing potential odor impacts is to gather and disclose applicable information regarding the characteristics of the buffer zone between the sensitive receptor(s) and the odor source(s), local meteorological conditions, and the nature of the odor source. Consideration of such parameters assists in evaluating the potential for odor impacts as a result of the proposed Project. The impact of an existing odor source on surrounding sensitive receptors should also be considered. Lead agencies may identify the number of confirmed complaints received for that specific odor source. BAAQMD recommends comparing the odor parameters (i.e., distance and wind direction) associated with the odor complaints that have been filed with those of the proposed Project (BAAQMD, 2017a).

4.2.5 Impact Analysis

Air Quality Plan

Impact AIR-1: The Project could conflict with or obstruct implementation of the applicable air quality plan. (Criterion a) (*Less than Significant, No Mitigation Required*)

The most recently adopted air quality plan in the San Francisco Bay Area Air Basin is the BAAQMD's *Bay Area 2017 Clean Air Plan* (2017 CAP; BAAQMD, 2017c). The 2017 CAP is an integrated, multi-pollutant air quality plan created to address the air quality and climate protection. The 2017 CAP was also produced to comply with State air quality planning requirements as codified in the California Health & Safety Code, to update the most recent ozone

plan, the 2010 Clean Air Plan. The 2017 CAP presents a strategy for how the San Francisco Bay Area will achieve compliance with the State eight-hour and one-hour ozone standards as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. The 2017 CAP also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the State one-hour ozone standard.

BAAQMD guidance states that "if approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project would be considered consistent with the 2017 CAP." As indicated in the discussion below (**Impact AIR-2**), the Project would not result in significant and unavoidable air quality impacts, because the Project would have a less-than-significant construction impact on air quality after implementation of feasible mitigation measures, as well as a less-than-significant operational impact on air quality. Consequently, based on BAAQMD guidance, the Project is also considered consistent with the 2017 CAP. This would be a less-than-significant impact.

Mitigation: None required.

Criteria Air Pollutants

Impact AIR-2: Emissions from construction and operation of the Project would result in increased emissions of criteria air pollutants and contribute to existing air quality violations (Criteria b and c) (*Potentially Significant prior to Mitigation*)

Construction

Construction of the Project would result in emissions of criteria pollutants from the use of heavy-duty construction equipment, haul truck trips, and vehicle trips generated from construction workers traveling to and from the site. In addition, fugitive dust PM_{10} emissions would result from excavation, trenching, and other construction activities.

Construction-related emissions from the Project were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2, based on the anticipated construction of 144 single-family detached homes and a conservative estimate of the Project footprint. Off-site improvements to Palms Drive and the extension of a water line through Central Avenue, under Pacheco Creek and the neighboring Conco property, were also included, along with an assumption that on-site earthwork would result in an overall balanced design which would not require any import or export of material. The Project site is currently undeveloped; therefore, no demolition activities would be necessary during construction of the Project. Construction was assumed to occur over an approximately three-year period beginning in late 2018, and it was

conservatively assumed for the purposes of a thorough analysis of air quality impacts that construction of all Project elements would occur in a single phase with overlapping components of building construction, paving, and architectural coating. All model inputs and outputs are provided in Appendix B. The approximately three-year construction period is now anticipated to start with grading in late 2021 and house completion in 2024. Thus, this analysis represents a conservative analysis (showing greater emissions than actually would occur), based on a nearer-term construction period and prior emissions factors. As shown in **Table 4.2-4**, estimated peak daily construction-related exhaust emissions would not exceed the thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Because estimated average daily construction emissions are less than the thresholds for NOx, ROG, PM_{10} and $PM_{2.5}$ the impact of exhaust emissions is less than significant.

TABLE 4.2-4
AVERAGE DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS (POUNDS PER DAY) WITHOUT MITIGATION

	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Project Construction Emissions	13.38	21.85	0.75	0.69
BAAQMD Threshold for Significant Construction Impacts	54	54	82	54
Potential Significant Impact?	No	No	No	No

SOURCE: ESA, Draft EIR Appendix B

Construction-related effects from fugitive dust from the proposed Project would be greatest during the site preparation and grading phases due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions in the area of the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity (amount of equipment operating), local weather conditions (such as wind speed), and characteristics such as soil moisture and silt content of the soil. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

For mitigation of fugitive dust emissions, the BAAQMD recommends implementing best management practices (BMPs), as a pragmatic and effective approach to controlling fugitive dust emissions (BAAQMD, 2017a). The BAAQMD notes that individual measures have been shown to reduce fugitive dust by anywhere from 30 percent to more than 90 percent. The BAAQMD considers any project's construction-related impacts to be less than significant if the required dust-control measures are implemented. Without these measures, the impact is generally considered to be significant, particularly if sensitive land uses are located in the Project vicinity. There are a number of residences located along the northern border of the Project site that would be impacted by fugitive dust generated by construction activities. Therefore, implementation of these BMPs would ensure the Project's fugitive dust emissions remained below a level of

significance. These BMPs are included as **Mitigation Measure AIR-1**, which would ensure the Project's impact would be less than significant with mitigation (see BAAQMD, 2017a, Table 2-1).

> **Mitigation Measure AIR-1: Best Management Practices for Controlling Particulate Emissions.** The Project applicant shall implement the following BAAQMD Best Management Practices for particulate control. These measures will reduce particulate emissions primarily during soil movement, grading and demolition activities but also during vehicle and equipment movement on unpaved areas.
>
> 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
> 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
> 3. 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.
> 4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
> 5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
> 6. 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, § 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
> 7. 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 accordance with manufacturer's specifications prior to operation.
> 8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Operation

Operational emissions of criteria pollutants were estimated using the CalEEMod version 2016.3.2 emissions inventory model (**Table 4.2-5**). All model inputs and outputs are provided in Appendix B.

Vehicle emissions from residential traffic associated with commuting and other daily travel would be the primary source of Project operational emissions. Traffic volumes used to estimate vehicle-related emissions were derived from the traffic study prepared for the Project (as discussed and presented in Section 4.13, *Transportation*). Project operations would

conservatively generate an estimated 1,371 daily vehicle trips.[3] In addition to exhaust emissions, vehicles would also generate PM_{10} and $PM_{2.5}$ from entrained road dust and tire and brake wear.

Emissions would also be generated by on-site natural gas combustion, operation of landscape maintenance equipment, and maintenance application of paint and other architectural coatings.

As shown in Table 4.2-5, estimated operational emissions would not exceed the thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$. Because average daily operational emissions are less than the thresholds for NOx, ROG, PM_{10} and $PM_{2.5}$ this impact is less than significant.

TABLE 4.2-5
UNMITIGATED AVERAGE OPERATIONAL CRITERIA POLLUTANT EMISSIONS

	Estimated Emissions (lbs/day)			
Air Pollutant	**ROG**	**NO_x**	**Exhaust PM_{10}**	**Exhaust $PM_{2.5}$**
Area Sources[a]	35.45	0.11	0.05	0.05
Energy Sources[a]	0.16	1.53	0.11	0.11
Mobile Sources[a]	1.97	9.04	0.05	0.05
Total	37.64	10.68	0.22	0.22
BAAQMD Threshold for Significant Operations Impacts[b]	54	54	82	54
Significant Impact?	No	No	No	No

NOTES:

a Mobile sources are motor vehicles and trucks. Area sources include landscape maintenance (equipment used for these activities such as gasoline-powered lawnmowers and blowers), maintenance application of paints and other interior and exterior surface coatings, and use of consumer products that result in emissions of ROG. Energy sources include natural gas combustion for space and water heating.

b Operational thresholds are from Table 2-1 of BAAQMD's 2017 CEQA Air Quality Guidelines (BAAQMD, 2017a).

SOURCE: ESA, Draft EIR Appendix B

Additionally, emissions from traffic at congested intersections can, under certain circumstances, cause a localized build-up of CO concentrations. The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD's CEQA Guidelines, a proposed project would result in a less-than significant impact due to localized CO concentrations if the following screening criteria are met:

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

[3] Project vehicle trip generation estimated in the September 2020 traffic study, and shown in Table 4.13-1 in this section of the Draft EIR, totaled 1,360 daily vehicle trips, 11 fewer than the 1,371 daily vehicle trips factored into this air quality analysis, the resulting emissions of which are negligibly overstated.

- The project 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, or below-grade roadway).

The proposed Project would not conflict with the Contra Costa County Transportation Authority's (CCTA) program for designated roads or highways, a regional transportation plan, or other agency plans (see Section 4.13, *Transportation*). Additionally, traffic generated by the proposed Project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. The study intersection volumes [Pacheco Blvd / Arthur Rd] would experience fewer than 107 AM and 143 PM vehicles per peak hour under existing plus Project and cumulative scenarios. Also, the Project traffic would not increase traffic volumes at affected intersections where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Because each of the three criteria would be met, Project-related traffic would not lead to violations of the CO standards; therefore, impacts related to CO would be considered less than significant.

Summary

As shown in Table 4.2-4, construction emissions associated with the Project would be less than significant for ROG, NO_x and $PM_{2.5}$ and PM_{10} exhaust emissions. The BAAQMD requires implementation of Best Management Practices to reduce construction dust-related impacts to a less than-significant level. Implementation of **Mitigation Measure AIR-1**, would reduce impacts to less than significant levels. The results shown in Table 4.2-5 indicates that the Project would not exceed the BAAQMD operational thresholds for ROG, NOx, PM_{10} or $PM_{2.5}$.and, thus, would have a less than significant effect on regional air quality. Additionally, elevated concentrations of localized CO from congested traffic would not cause a violation of ambient air quality standards; therefore, impacts would be less than significant.

Mitigation Measure: Implement Mitigation Measure AIR-1 (see under Impact AIR-1).

Significance after Mitigation: Less Than Significant.

Toxic Air Contaminants

Impact AIR-3: Construction of the Project could increase emissions of toxic air contaminants (TACs), and increase health risks for nearby residents, and Project operations could expose sensitive receptors to substantial pollutant concentrations including toxic air contaminants and increase health risks for existing and proposed residents. (Criterion d) (*Potentially Significant prior to Mitigation*)

The proposed Project would constitute a new, temporary emission source of DPM and $PM_{2.5}$ due to its construction activities. Studies have demonstrated that DPM from diesel-fueled engines is a

human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. The proposed Project would also locate sensitive receptors near existing permitted stationary sources. To assess risks associated with TACs that would be generated by construction equipment and stationary sources, a Health Risk Assessment (Appendix C to this Draft EIR) was prepared for the proposed Project.

Health Impacts on Existing Residences

As stated in the Approach to Analysis, based on BAAQMD-developed thresholds, the proposed Project would be considered to have a significant health risk impact if Project emissions would result in exposure of persons to substantial levels of TACs resulting in (a) an incremental cancer risk level greater than 10 in one million, (b) a noncancerous risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$).

The following describes the HRA results associated with existing receptors due to unmitigated proposed Project construction activities. The maximum cancer risk from unmitigated proposed Project construction emissions for a residential-adult receptor would be 2.6 per million and for a residential-child receptor would be 47.2 per million. As shown in **Table 4.2-6**, the total maximum cancer risk from unmitigated proposed Project construction emissions for a residential receptor would be 47.2 per million.[4] The maximum concentrations would occur at a residential receptor (also known as the maximum exposed individual or MEI) along Central Avenue to the north of the Project site (shown in **Figure A-1** within **Appendix C)**. Thus, the cancer risk due to construction activities are above the BAAQMD threshold of 10 per million and would be potentially significant.

TABLE 4.2-6
ESTIMATED HEALTH IMPACTS FOR EXISTING RECEPTORS WITHOUT MITIGATION

	Increased Cancer Risk (adult/child)	Hazard Impact (acute/chronic)	Exhaust $PM_{2.5}$
Unmitigated Project Construction	2.63/47.2	0.22/0.03	0.17
Total Project	**2.63/47.2**	0.22/0.03	0.17
BAAQMD Construction Threshold	10	1.0	0.3
Potential Significant Impact?	**Yes**	No	No

NOTE: **Bolded** figures indicate values exceed significance threshold.

SOURCE: RCH, Draft EIR Appendices B and C

Therefore, the proposed Project would be required to implement **Mitigation Measure AIR-2**; BAAQMD's *Enhanced Exhaust Emission Reduction Measures*.

[4] This theoretical individual would be born on construction year 2 and subsequently be exposed to the construction period. Individuals born on construction year 1 or after construction year 2 would be exposed to shorter construction duration and/or less emissions and thus, result in a lower risk and health impacts.

Mitigation Measure AIR-2: Enhanced Exhaust Emissions Reduction Measures. The applicant shall implement the following measures during construction to further reduce construction-related exhaust emissions:

All off-road equipment greater than 25 horsepower (hp) and operating for more than 20 total hours over the entire duration of construction activities shall meet the following requirements:

1. Where access to alternative sources of power are available, portable diesel engines shall be prohibited; and
2. All off-road equipment shall have:
    a. Engines that meet or exceed either USEPA or CARB Tier 3 off-road emission standards, and
    b. Engines that are retrofitted with a CARB Level 3 Verified Diesel Emissions Control Strategy. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such are available.

As shown in **Table 4.2-7**, with the implementation of **Mitigation Measure AIR-2**, the maximum cancer risk from proposed Project construction for a residential-adult receptor would be 0.4 per million and for a residential-child receptor would be 7.1 per million. The total maximum cancer risk from mitigated proposed Project construction emissions for a residential receptor would be 7.1 per million. Thus, the cancer risk due to construction activities are below the BAAQMD threshold of 10 per million and would be less than significant with mitigation.

TABLE 4.2-7
ESTIMATED HEALTH IMPACTS FOR EXISTING RECEPTORS WITH MITIGATION

	Increased Cancer Risk (adult/child)	Hazard Impact (acute/chronic)	Exhaust $PM_{2.5}$
Mitigated Project Construction	0.39/7.07	0.03/0.01	0.03
Total Project	0.39/7.07	0.03/0.01	0.03
BAAQMD Construction Threshold	10	1.0	0.3
Potential Significant Impact?	No	No	No

NOTE: **Bolded** figures indicate values exceed significance threshold.

SOURCE: RCH, Appendix C

CalEEMod results (see **Appendix B** to this Draft EIR) estimated total proposed Project exhaust $PM_{2.5}$ emissions (assumed to be DPM) for the off-road construction equipment. The total unmitigated exhaust $PM_{2.5}$ emissions would be approximately 0.70 tons over the construction period. The total mitigated exhaust $PM_{2.5}$ emissions would be approximately 0.10 over the construction period, which is an 85 percent control efficiency. Impacts from Project operation are expected to be minimal due to the use of motor vehicles, which emit only negligible levels of TAC.

Non-Cancer Health Hazard Associated with Existing Receptors

Both acute (short-term) and chronic (long-term) adverse health impacts unrelated to cancer are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental DPM exposure concentration from the proposed Project to a reference exposure level (REL) that could cause adverse health effects. The REL are published by OEHHA based on epidemiological research. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. The impact is considered to be significant if the overall HI for the highest-impacted organ system is greater than 1.0.

There is no acute REL for DPM. However, diesel exhaust does contain acrolein, formaldehyde and other compounds, which do have an acute REL. Based on DPM speciation data, acrolein emissions are approximately 1.3 percent of the total DPM emissions (CARB, 2017). The acute REL for acrolein was established by the California OEHHA as 2.5 $\mu g/m^3$(OEHHA, 2016). In total, acrolein emissions represent over 90 percent of the acute health impacts from diesel engines.

The unmitigated acute HI would be 0.22, based on a Project-related maximum 1-hour diesel concentration of 43.0 $\mu g/m^3$, respectively (per dispersion modeling analysis) and acrolein speciation of 1.3 percent for DPM or 43.0 $\mu g/m^3$/2.5 $\mu g/m^3$ times 1.3 percent, which is 0.22. The mitigated acute HI would be 0.03. The acute HI would be below the Project-level threshold of 1 and the impact of the proposed Project would therefore be less than significant.

The chronic reference exposure level for DPM was established by the California OEHHA as 5 $\mu g/m^3$(OEHHA, 2016). Thus, the proposed Project-related annual concentration of DPM cannot exceed 5.0 $\mu g/m^3$; resulting in a chronic acute HI of greater than 1.0 (i.e., DPM annual concentration/5.0 $\mu g/m^3$).

The unmitigated chronic HI would be 0.03, based on a proposed Project-related maximum annual diesel concentration of 0.17 $\mu g/m^3$ (per dispersion modeling analysis) or 0.17 $\mu g/m^3$/5.0 $\mu g/m^3$, which is 0.03. The mitigated chronic HI would be less than 0.01. The chronic HI would be below the Project-level threshold of 1 and the impact of the proposed Project would therefore be less than significant.

$PM_{2.5}$ Concentration

The proposed Project's unmitigated annual $PM_{2.5}$ concentration from construction activities would be 0.17 $\mu g/m^3$. With implementation of **Mitigation Measure AIR-2**, the annual $PM_{2.5}$ concentration would be reduced to 0.03 $\mu g/m^3$. Thus, the annual $PM_{2.5}$ concentration due to Project construction would be below the BAAQMD threshold of 0.3 $\mu g/m^3$ and would be considered less than significant (see **Tables 4.2-6 and 4.2-7**).

Impact AIR-4: The Project would locate sensitive receptors near existing sources of objectionable odors. (Criterion e) (*Less than Significant, No Mitigation Required*)

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. None of these sources are proposed as part of the Project, and the Project would have a less than significant impact with respect to generating odor.

During construction, diesel exhaust from construction equipment would generate some odors. However, construction-related odors would be temporary and would not persist upon Project completion. Therefore, odor impacts from operation and construction would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact C-AIR-1: The Project, in combination with past, present, and reasonably foreseeable future development of cumulative projects would contribute to cumulative regional air quality impacts. (Criteria b and c) (*Potentially Significant prior to Mitigation*)

Regional air quality impacts are by their nature cumulative impacts. Emissions from past, present, and future projects contribute to adverse regional air quality impacts on a cumulative basis. According to the BAAQMD, in the case of criteria pollutants, no single project would be sufficient in size, by itself, to result in emissions that are considered significant (BAAQMD, 2017a). Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. As such, significance thresholds for regional air quality impacts are designed to establish cumulatively considerable contributions. Therefore, if a project exceeds the identified significance thresholds for criteria pollutants, its emissions would be cumulatively considerable and would result in significant adverse impacts to the region's existing air quality conditions. Conversely, if a project does not exceed the identified significance thresholds for criteria pollutants, its emissions would not be cumulatively considerable.

As described above under Impact AIR-2, emissions of oxides of ROG, NOx, PM_{10} and $PM_{2.5}$ due to the construction and operation of the proposed Project would be below BAAQMD CEQA thresholds of significance, with implementation of **Mitigation Measure AIR-1**. Additionally, elevated concentrations of localized CO from congested traffic would not cause a violation of ambient air quality standards per the BAAQMD threshold of significance and screening methodology.

These thresholds are based on the federal Clean Air Act New Source Review Program, under which the BAAQMD requires that new stationary sources of pollutants must offset a portion of their emissions above a specified threshold, to ensure that these new sources do not cause or contribute to a violation of an air quality standard. Thus, the BAAQMD CEQA thresholds for regional criteria pollutants represent emissions levels at which new sources would not contribute to an air quality violation or result in a considerable net increase in criteria air pollutants, within

the context of existing and future cumulative air quality conditions. Consequently, although the region is in non-attainment for pollutants including ozone, PM_{10} and $PM_{2.5}$, because the Project would not exceed the applicable CEQA thresholds with respect to criteria pollutants, according to the BAAQMD, the Project would not make a considerable contribution to cumulative air quality impacts with the implementation of mitigation, and the cumulative impact of the Project would be less than significant.

Mitigation Measure: Implement Mitigation Measure AIR-1.

Significance after Mitigation: Less than Significant.

Impact C-AIR-2: The Project, in combination with past, present, and reasonably foreseeable future development of cumulative projects would contribute to cumulative health risk impacts on sensitive receptors. (Criterion d) (*Less than Significant, No Mitigation Required*)

Table 4.0-1 identifies cumulative projects and plans within the Contra Costa County. The BAAQMD considers the relevant zone of influence for an assessment of air quality health risks to be within 1,000 feet of a project site. Of the cumulative projects and plans identified in Table 4.0-1, some would be located within 1,000 feet of the Project site.

TABLE 4.2-8
ESTIMATED CUMULATIVE HEALTH IMPACTS FOR EXISTING RECEPTORS

Source	Cancer Risk (in one million)	Hazard Impact (acute/chronic)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Interstate 680	Beyond 1,000 feet		
Rail Activities	Beyond 1,000 feet		
Central Contra Costa Sanitary District[a]	10.0	0.003	0.001
Mitigated Proposed Project Construction[b]	7.07	0.03	0.03
Palms 10 Subdivision Construction[c]	N/A	N/A	N/A
Total Impacts	17.07	.033	0.031
BAAQMD Significance Threshold	100	10	0.8
Potentially Significant Impact?	No	No	No

NOTES: **Bolded** figures indicate values exceed significance threshold

[a] Cancer Risk, Hazard Impact, and $PM_{2.5}$ Concentration values for permitted stationary sources are based on the BAAQMD's *Stationary Source Risk & Hazard Analysis Tool*, dated May 30, 2012. Cancer Risk was adjusted by a factor of 2.6 to account for the Revised OEHHA Guidance Manual, See Appendix B (Attachment A) for details.

[b] Cancer Risk, Hazard Impact, and $PM_{2.5}$ Concentration values are based on AERMOD dispersion modeling analysis, See Appendix B (Attachment A) for details.

[c] The applicant is the developer for the Palms 10 Subdivision Project and can confirm that the two projects would not occur simultaneously, but would be sequenced consecutively.

SOURCE: Draft EIR Appendix C

As discussed under Impact AIR-3, the maximally exposed sensitive receptor with respect to the Project site are residences located north along Central Avenue.

As shown in Table 4.2-8, the conservative maximum cancer risk from proposed Project construction and other existing and foreseeable pollutant sources would, with **Mitigation Measure AIR-2** for a residential-child receptor, be 17.07 per million, with a Hazard Impact of 0.033 and a PM2.5 concentration of 0.031 $\mu g/m^3$. Each of these very conservative estimates are well below the corresponding BAAQMD cumulative significance threshold.

Overall, the Project, as mitigated, combined with other past, present, or reasonably foreseeable future projects, would not result in a cumulative impact to which the proposed Project would have a cumulatively considerably contribution.

Mitigation: None required.

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