4.2 AIR QUALITY

This section has been prepared using methodologies and guidance provided in the air quality impact assessment guidelines of the Bay Area Air Quality Management District (BAAQMD).[1] In keeping with these guidelines, this section describes existing air quality, impacts of project-related construction and operational emissions on air quality, and impacts on sensitive receptors from exposure to toxic air contaminants (TACs) generated during the construction and operation of the proposed project. A construction health risk assessment (HRA) was performed and is included in this section. Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate.

4.2.1 Environmental Setting

4.2.1.1 Regional Setting

The California Air Resources Board (CARB) has divided California into regional air basins according to topographic features. The proposed project is located in Solano County, which is located in the San Francisco Bay Area Air Basin (Air Basin). The primary factors that determine air quality are the locations of air pollutant sources, the amount of pollutants emitted, and meteorological and topographical conditions affecting their dispersion. Atmospheric conditions, including wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The following sections provide a description of key air pollutants that affect air quality, and the existing environment as it relates to climate, meteorological conditions, and ambient air quality conditions of the Air Basin and the project area.

4.2.1.2 Air Pollutants and Health Effects

Both State and federal governments have identified six air pollutants as criteria air pollutants[2] and have established health-based Ambient Air Quality Standards for these pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally near the sources where they are emitted. Each of the criteria pollutants is described below along with the health effects that are known to result from substantial exposure to emissions of these pollutants.

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1 Bay Area Air Quality Management District (BAAQMD). 2017b. *California Environmental Quality Act, Air Quality Guidelines*. May.

2 Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Ozone. 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) The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion of fossil fuels in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the San Francisco Bay Area (Bay Area), automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide. CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO transport is limited – it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Exposure to extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

Particulate Matter. Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is categorized in two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad, tire wear, and entrained road dust. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of emissions of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the CARB, studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks, and studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function growth in children.[3] Statewide attainment of particulate matter standards could reduce premature deaths, hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and episodes of respiratory illness in California.

Nitrogen Dioxide. NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring

[3] California Air Resources Board (CARB). 2020. *Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10})*. Website: ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health (accessed February 2022).

component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide. SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 also reduces visibility and the level of sunlight at the ground surface.

Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the United States Environmental Protection Agency (USEPA) established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of USEPA regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Air pollutants and their health effects, and other air pollution-related considerations are summarized in **Table 4.2.A: Sources and Health Effects of Air Pollutants**.

Toxic Air Contaminants. In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the USEPA and the CARB. In 1998, the CARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. The CARB has completed a risk management process that identified potential cancer risks for a range of activities and land uses that are characterized by use of diesel-fueled engines.[4] High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

[4] CARB. 2000. *Fact Sheet – California's Plan to Reduce Diesel Particulate Matter Emissions*. October. Available online at: www.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf (accessed February 2022).

Table 4.2.A: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Ozone (O_3)	• Precursor sources: motor vehicles, industrial emissions, and consumer products	• Respiratory symptoms • Worsening of lung disease leading to premature death • Damage to lung tissue • Crop, forest, and ecosystem damage • Damage to a variety of materials, including rubber, plastics, fabrics, paints, and metals
Particulate Matter Less than 2.5 Microns in Aerodynamic Diameter ($PM_{2.5}$)	• Cars and trucks (especially diesels) • Fireplaces, woodstoves • Windblown dust from roadways, agriculture, and construction	• Premature death • Hospitalization for worsening of cardiovascular disease • Hospitalization for respiratory disease • Asthma-related emergency room visits • Increased symptoms, increased inhaler usage
Particulate Matter Less than 10 Microns in Aerodynamic Diameter (PM_{10})	• Cars and trucks (especially diesels) • Fireplaces, woodstoves • Windblown dust from roadways, agriculture, and construction	• Premature death and hospitalization, primarily for worsening of respiratory disease • Reduced visibility and material soiling
Nitrogen Oxides (NO_X)	• Any source that burns fuels such as cars, trucks, construction and farming equipment, and residential heaters and stoves	• Lung irritation • Enhanced allergic responses
Carbon Monoxide (CO)	• Any source that burns fuels such as cars, trucks, construction and farming equipment, and residential heaters and stoves	• Chest pain in patients with heart disease • Headache • Light-headedness • Reduced mental alertness
Sulfur Oxides (SO_X)	• Combustion of sulfur-containing fossil fuels • Smelting of sulfur-bearing metal ores • Industrial processes	• Worsening of asthma: increased symptoms, increased medication usage, and emergency room visits
Lead (Pb)	• Contaminated soil	• Impaired mental functioning in children • Learning disabilities in children • Brain and kidney damage
Toxic Air Contaminants (TACs)	• Cars and trucks (especially diesels) • Industrial sources, such as chrome platers • Neighborhood businesses, such as dry cleaners and service stations • Building materials and products	• Cancer • Reproductive and developmental effects • Neurological effects

Source: California Air Resources Board (2018).

[a] Ozone is not generated directly by these sources. Rather, chemicals emitted by these precursor sources react with sunlight to form ozone in the atmosphere.

The BAAQMD regulates TACs using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, in order to provide a quantitative estimate of health risks.[5] As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. Monitoring data and emissions inventories of TACs help the BAAQMD determine health risk to Bay Area residents.

Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for a substantial portion of the ambient background risk in the Bay Area.[6] According to the BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline. Due to this reduction, the calculated average cancer risk based on monitoring results has also been reduced.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources – primarily "off-road" sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in urban parts of the Bay Area, while construction equipment typically operates for a limited time at various locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic.

High Volume Roadways. Air pollutant exposures and their associated health burdens vary considerably within places in relation to sources of air pollution. Motor vehicle traffic is perhaps the most important source of intra-urban spatial variation in air pollution concentrations. Air quality research consistently demonstrates that pollutant levels are substantially higher near freeways and busy roadways, and human health studies have consistently demonstrated that children living within 100 to 200 meters (328 to 656 feet) of freeways or busy roadways have reduced lung function and higher rates of respiratory disease. At present, it is not possible to attribute the effects of roadway proximity on non-cancer health effects to one or more specific vehicle types or vehicle pollutants. Engine exhaust, from diesel, gasoline, and other combustion engines, is a complex mixture of particles and gases, with collective and individual toxicological characteristics.

Sensitive Receptors. Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory

[5] In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

[6] BAAQMD. 2015. *Toxic Air Contaminant Control Program Annual Report, Volume 1.* May. Website: www.baaqmd.gov/research-and-data/air-toxics/annual-report (accessed February 2022).

disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise. These populations are referred to as sensitive receptors.

The project site is surrounded by commercial, office, and residential uses and transportation facilities. The nearest sensitive receptors to the project site are single-family homes adjacent to the northern property line. In addition, an assisted living facility and NorthBay Center Hospital are located approximately 0.25 mile northeast of the project site.

4.2.1.3 National and State Ambient Air Quality Standards

Both State and federal governments have established health-based Ambient Air Quality Standards for criteria air pollutants. As noted earlier, criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the USEPA and the CARB have established ambient air quality standards for the following common pollutants: CO, O_3, NO_2, SO_2, Pb, and suspended particulate matter. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. These ambient air quality standards are levels of contaminants that avoid specific adverse health effects associated with each pollutant.

Federal standards include both primary and secondary standards. Primary standards establish limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.[7] State and federal standards for the criteria air pollutants are listed in **Table 4.2.B: Federal and State Ambient Air Quality Standards**.

4.2.1.4 Existing Climate and Air Quality

Regional and Local Air Quality. Fairfield is located in the northern part of the San Francisco Bay Area Air Basin (Air Basin), a large shallow air basin ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

[7] United States Environmental Protection Agency (USEPA). 2017. Criteria Air Pollutants. October. Website: www.epa.gov/criteria-air-pollutants (accessed February 2022).

Table 4.2.B: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O_3)[h]	1-Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM_{10})[i]	24-Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		–		
Fine Particulate Matter ($PM_{2.5}$)[i]	24-Hour	–		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12.0 µg/m³		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–	–	
Nitrogen Dioxide (NO_2)[j]	Annual Arithmetic Mean	0.03 ppm (57 µg/m³)	Gas Phase Chemi-luminescence	53 ppb (100 µg/m³)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m³)		100 ppb (188 µg/m³)	–	
Lead (Pb)[l,m]	30-Day Average	1.5 µg/m³	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m³ (for certain areas)[l]	Same as Primary Standard	
	Rolling 3-Month Average [i]	–		0.15 µg/m³		
Sulfur Dioxide (SO_2)[k]	24-Hour	0.04 ppm (105 µg/m3)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m³)	
	1-Hour	0.25 ppm (655 µg/m³)		75 ppb (196 µg/m³)[k]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[k]	–	
Visibility-Reducing Particles [l]	8-Hour	See footnote [n]	Beta Attenuation and Transmittance through Filter Tape	No Federal Standards		
Sulfates	24-Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride [j]	24-Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

Source: Ambient Air Quality Standards (California Air Resources Board 2016).

Table notes continued on the following page

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

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

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

[d] Any equivalent measurement method which can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

[g] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

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

[i] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24- hour PM2.5 standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

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

[k] 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 three-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 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.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[l] CARB 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.

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

[n] In 1989, CARB 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.

°C = degrees Celsius
CARB = California Air Resources Board
USEPA = United States Environmental Protection Agency
ppb = parts per billion
ppm = parts per million
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

The City is within the jurisdiction of the BAAQMD, which regulates air quality in the Bay Area. Air quality conditions in the Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. Neither State nor national ambient air quality standards of the following chemicals have been violated in recent decades: nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and vinyl chloride. Those exceedances of air quality standards that do occur primarily happen during meteorological conditions conducive to high pollution levels, such as cold, windless nights or hot, sunny summer afternoons.

Ozone levels, measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the BAAQMD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health; however, the Bay Area still exceeds the State standard for 1-hour ozone as well as the State and federal 8-hour standards. Levels of PM_{10} have exceeded State standards two of the last three years, and the area is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM_{10} standard. No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

Local Climate and Air Quality. Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Two meteorological factors affect air quality in Fairfield: wind and temperature. Winds affect the direction of transport of any air pollution emissions and wind also controls the volume of air into which pollution is mixed in a given period of time. While winds govern horizontal mixing processes, temperature inversions determine the vertical mixing depth of air pollutants.

Fairfield is located in Solano County, which is bordered by Napa and Yolo Counties to the north, Sacramento County to the east, and San Pablo Bay to the south. The BAAQMD has jurisdiction over the southwestern portion of the county, which includes Fairfield.

During summer and fall months, high pressure offshore, coupled with thermal low pressure in the Central Valley, draws marine air eastward through the Carquinez Strait almost daily. Temperatures along the coast and inland tend to remain moderate. Winter temperatures range from cool overnight to moderate during the day, while summer temperatures range from moderate overnight to warm during the day. Afternoon westerly winds are common in the southern portion of the county, along the Carquinez Strait. Annual rainfall totals range from 13 inches near the coast to 22 inches inland in Fairfield.[8]

[8] BAAQMD. 2019. *Climate and Air Quality in San Mateo County.* February 14, 2019. Website: https://www.baaqmd.gov/about-the-air-district/in-your-community/solano-county (accessed February 2022).

Ozone and fine particle pollution, or $PM_{2.5}$, are the major regional air pollutants of concern in the Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter.[9]

In summer, most of Solano County is exposed to prevailing westerly winds through the Carquinez Strait, which mixes and reduces ozone levels by drawing cooler, marine air from the Pacific Ocean and San Pablo Bay eastward. However, when the marine flow is weak or nonexistent, ozone levels may exceed health standards on a few days each year, mainly east of Suisun City.[10]

In Solano County, $PM_{2.5}$ concentrations can become elevated enough to exceed health standards during the winter when air pollution is transported from the Central Valley due to prevailing easterly winds. Local residential wood burning can also cause elevated particulate levels on cold, calm evenings during winter.[11]

Air Quality Monitoring Results. Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as attainment or nonattainment depending on whether the regions met the requirements stated in the primary National Ambient Air Quality Standards (NAAQS). Attainment areas are required to maintain their status through moderate, yet effective, air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data. The Air Basin's attainment status for each criteria pollutant is listed in **Table 4.2.C: San Francisco Bay Area Basin Attainment Status**.

The CARB and USEPA maintain ambient air quality monitoring stations within California. The air quality monitoring station closest to the project site is the 1010 Chadbourne Road monitoring station in Fairfield. The air quality trends from this station are used to represent the ambient air quality in the project area. Ambient air quality in the project area from 2018 to 2020 (the most recent available period) is shown in **Table 4.2.D: Ambient Air Quality at the Nearest Monitoring Stations**. The only monitored pollutant at the 1010 Chadbourne Road Fairfield station was O_3. Therefore, CO, O_3, $PM_{2.5}$, NO_2, and SO_2 air quality trends are from the 304 Tuolumne Street air quality monitoring station in Vallejo and PM_{10} air quality trends are from the 650 Merchant Street monitoring station in Vacaville.

9 BAAQMD. 2019. *Climate and Air Quality in San Mateo County.* February 14, 2019. Website: https://www.baaqmd.gov/about-the-air-district/in-your-community/solano-county (accessed February 2022).

10 Ibid.

11 Ibid.

Table 4.2.C: San Francisco Bay Area Basin Attainment Status

	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration [c]	Attainment Status
Ozone (O_3)	8-Hour	0.070 ppm (137µg/m³)	Nonattainment [l]	0.070 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 µg/m³)	Nonattainment	Not Applicable	[e]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m³)	Attainment	9 ppm (10 mg/m³)	Attainment [f]
	1-Hour	20 ppm (23 mg/m³)	Attainment	35 ppm (40 mg/m³)	Attainment
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m³)	Attainment	0.100 ppm [k]	[k]
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	Not Applicable	0.053 ppm (100 µg/m³)	Attainment
Sulfur Dioxide (SO_2) [l]	24-Hour	0.04 ppm (105 µg/m³)	Attainment	0.14 ppm (365 µg/m³)	[l]
	1-Hour	0.25 ppm (655 µg/m³)	Attainment	0.075 ppm (196 µg/m³)	[l]
	Annual Arithmetic Mean	Not Applicable	Not Applicable	0.030 ppm (80 µg/m³)	[l]
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m³	Nonattainment [g]	Not Applicable	Not Applicable
	24-Hour	50 µg/m³	Nonattainment	150 µg/m³	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m³	Nonattainment [g]	15 µg/m³ [0]	Unclassified/ Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m³ [j]	Nonattainment
Sulfates	24-Hour	25 µg/m³	Attainment	Not Applicable	Not Applicable
Lead (Pb) [m]	30-Day Average	1.5 µg/m³	Not Applicable	Not Applicable	Attainment
	Calendar Quarter	Not Applicable	Not Applicable	1.5 µg/m³	Attainment
	Rolling 3-Month Average [n]	Not Applicable	Not Applicable	0.15 µg/m³	[n]
Hydrogen Sulfide	1-Hour	0.010 ppm (26 µg/m³)	Unclassified	Not Applicable	Not Applicable
Vinyl Chloride (chloroethene)	24-Hour	0.010 ppm (26 µg/m³)	No Information Available	Not Applicable	Not Applicable
Visibility Reducing Particles	8-Hour (10:00 to 18:00 PST)	[h]	Unclassified	Not Applicable	Not Applicable

Source: Bay Area Attainment Status (Bay Area Air Quality Management District 2017a).

Table notes continued on the following page

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the State standard.

[b] National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the three-year average of the 4th highest daily concentrations is 0.070 ppm (70 ppb) or less. The 24-hour PM_{10} standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the three-year average of 98th percentiles is less than 35 µg/m^3.
Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the three-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the three-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

[c] National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.

[d] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. USEPA will make recommendations on attainment designations by October 1, 2016, and issue final designations October 1, 2017. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.

[e] The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.

[f] In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

[g] In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

[h] Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

[i] The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005, and became effective on May 17, 2006.

[j] On January 9, 2013, USEPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This USEPA rule suspends key SIP requirements as long as monitoring data continue to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area will continue to be designated as “non-attainment” for the national 24-hour $PM_{2.5}$ standard until such time as the Air District submits a “redesignation request” and a “maintenance plan” to USEPA and USEPA approves the proposed redesignation.

[k] To attain this standard, the three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). The USEPA expects to make a designation for the Bay Area by the end of 2017.

[l] On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030-ppm annual and 0.14-ppm 24-hour SO_2 NAAQS however must continue to be used until one year following USEPA initial designations of the new 1-hour SO_2 NAAQS. USEPA expects to make designation for the Bay Area by the end of 2017.

[m] CARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure below which there are no adverse health effects determined.

[n] National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

[o] In December 2012, USEPA strengthened the annual $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) from 15.0 to 12.0 micrograms per cubic meter (µg/m^3). In December 2014, USEPA issued final area designations for the 2012 primary annual $PM_{2.5}$ NAAQS. Areas designated “unclassifiable/attainment” must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.

µg/m^3 = micrograms per cubic meter
CARB = California Air Resources Board
mg/m^3 = milligrams per cubic meter
ppm = parts per million
USEPA = United States Environmental Protection Agency

Table 4.2.D: Ambient Air Quality at the Nearest Monitoring Stations

Pollutant	Standard	2018	2019	2020
Carbon Monoxide (CO)[b]				
Maximum 1-hour concentration (ppm)		2.8	1.9	2.5
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		2.4	1.5	1.7
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)[a]				
Maximum 1-hour concentration (ppm)		0.078	0.080	0.098
Number of days exceeded:	State: > 0.09 ppm	0	0	1
Maximum 8-hour concentration (ppm)		0.067	0.068	0.082
Number of days exceeded:	State: > 0.07 ppm	0	0	3
	Federal: > 0.07 ppm	0	0	3
Coarse Particulates (PM_{10})[c]				
Maximum 24-hour concentration (µg/m^3)		123.0	70.0	326.0
Number of days exceeded:	State: > 50 µg/m^3	ND	ND	ND
	Federal: > 150 µg/m^3	0	0	2
Annual arithmetic average concentration (µg/m^3)		ND	ND	ND
Exceeded for the year:	State: > 20 µg/m^3	ND	ND	ND
	Federal: > 50 µg/m^3	ND	ND	ND
Fine Particulates ($PM_{2.5}$)[b]				
Maximum 24-hour concentration (µg/m^3)		197.2	30.6	153.2
Number of days exceeded:	Federal: > 35 µg/m^3	13	0	12
Annual arithmetic average concentration (µg/m^3)		13.3	8.6	12.0
Exceeded for the year:	State: > 12 µg/m^3	Yes	No	No
	Federal: > 15 µg/m^3	Yes	No	No
Nitrogen Dioxide (NO_2)[b]				
Maximum 1-hour concentration (ppm)		0.057	0.053	0.048
Number of days exceeded:	State: > 0.250 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.008	0.007	0.007
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[b]				
Maximum 1-hour concentration (ppm)		0.0067	0.0109	0.0072
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Maximum 24-hour concentration (ppm)		0.0002	0.0019	0.0002
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.0001	0.0001	0.0001
Exceeded for the year:	Federal: > 0.030 ppm	No	0	0

Source: California Air Resources Board and U.S. Environmental Protection Agency (2021).

[a] Data taken at the 1010 Chadborne Road air quality monitoring station in Fairfield.

[b] Data taken at the 304 Tuolumne Street air quality monitoring station in Vallejo.

[c] Data taken at the 650 Merchant Street air quality monitoring station in Vacaville.

µg/m^3 = micrograms per cubic meter

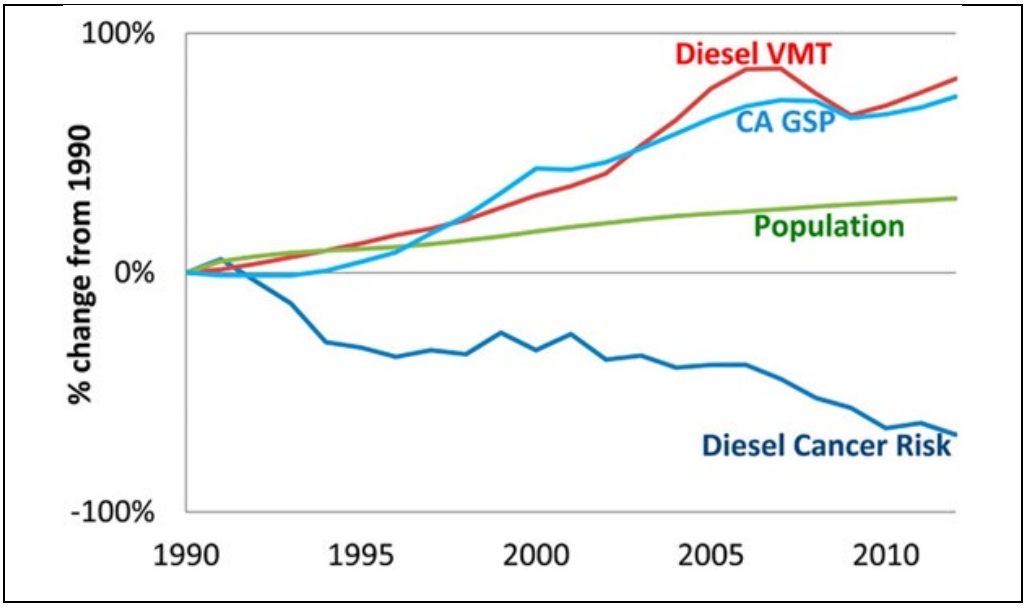
ND = No data. There were insufficient (or no) data results to determine the value.

ppm = parts per million

Pollutant monitoring results indicate that air quality in the Solano County area has generally been good. As indicated in the monitoring results, 1-hour ozone concentrations exceeded the State standard once in 2020 and the 8-hour ozone concentrations exceeded the State and federal standards three times in 2020. The federal PM_{10} standard was exceeded twice in 2018 and 2020 and the State PM_{10} standard was exceeded an unknown number of times in 2018, 2019, and 2020. In addition, the federal $PM_{2.5}$ standard was exceeded 13 times in 2018 and 12 times in 2020. The CO, NO_2, and SO_2 standards were not exceeded in this area during the three-year period.

Toxic Air Contaminant Trends. In 1984, the CARB adopted regulations to reduce TAC emissions from mobile and stationary sources, as well as consumer products. A CARB study showed that ambient concentrations and emissions of the seven TACs responsible for the most cancer risk from airborne exposure declined by 76 percent between 1990 and 2012.[12] Concentrations of diesel particulate matter, a key TAC, declined by 68 percent between 1990 and 2012, despite a 31 percent increase in State population and an 81 percent increase in diesel vehicle miles traveled (VMT), as shown on **Figure 4.2-1: California Population, Gross State Product (GSP), Diesel Cancer Risk, and Diesel Vehicle Miles Traveled (VMT) Regulatory Context**. The study also found that the significant reductions in cancer risk to California residents from the implementation of air toxics controls are likely to continue.

Figure 4.2-1: California Population, Gross State Product (GSP), Diesel Cancer Risk, and Diesel Vehicle Miles Traveled (VMT) Regulatory Context



Source: Ambient and Emission Trends of Toxic Air Contaminants in California (Propper, Ralph, et al. 2015).

[12] Propper, Ralph, et al. 2015. Ambient and Emission Trends of Toxic Air Contaminants in California. *American Chemical Society: Environmental Science & Technology*. Website: pubs.acs.org/doi/full/10.1021/acs.est.5b02766 (accessed February 2022).

4.2.2 Regulatory Setting

The USEPA and the CARB regulate direct emissions from motor vehicles. The BAAQMD is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. BAAQMD's jurisdiction encompasses seven counties – Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa—and portions of Solano and Sonoma counties.

4.2.2.1 Federal Laws and Regulations

At the federal level, the USEPA is charged with implementing national air quality programs. USEPA air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required the USEPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA 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. The USEPA has responsibility to review all state SIPs to determine conformity with the mandates of the FCAA and determine if implementation will achieve air quality goals. If the USEPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area, which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions on transportation funding and stationary air pollution sources in the air basin.

The USEPA is also required to develop National Emission Standards for Hazardous Air Pollutants, which are defined as those which may reasonably be anticipated to result in increased deaths or serious illness, and which are not already regulated. An independent science advisory board reviews the health and exposure analyses conducted by the USEPA on suspected hazardous pollutants prior to regulatory development.

4.2.2.2 State Laws and Regulations

The CARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

The CARB is also primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. The CARB is primarily responsible for Statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. The CARB combines these data and submits the completed SIP to the USEPA.

Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for mobile sources, consumer products, small utility engines, and off-road vehicles. The CARB Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines.[13]

Because of the robust evidence relating proximity to roadways and a range of non-cancer and cancer health effects, the CARB also created guidance for avoiding air quality conflicts in land use planning in its *Air Quality and Land Use Handbook: A Community Health Perspective*.[14] In its guidance, the CARB advises that new sensitive uses (e.g., residences, schools, day care centers, playgrounds, and hospitals) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day, or within 1,000 feet of a distribution center (warehouse) that accommodates more than 100 trucks or more than 90 refrigerator trucks per day.

The CARB guidance suggests that the use of these guidelines be customized for individual land use decisions, and take into account the context of proposed development projects. The Air Quality and Land Use Handbook specifically states that these recommendations are advisory and acknowledges that land use agencies must balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

4.2.2.3 Regional Laws and Regulations

The BAAQMD seeks to attain and maintain air quality conditions in the Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

Clean Air Plan. The Clean Air Plan guides the region's air quality planning efforts to attain the CAAQS.[15] The BAAQMD 2017 Clean Air Plan, which was adopted on April 19, 2017, by the BAAQMD Board of Directors, is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (e.g., ROG and NO_x), particulate matter and greenhouse gas (GHG) emissions.

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13 CARB. 2000b, op. cit.

14 California Environmental Protection Agency and California Air Resources Board. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April. Available online at: www.arb.ca.gov/ch/handbook.pdf (accessed February 2022).

15 BAAQMD. 2017c. *Final 2017 Clean Air Plan*. April 19, 2017. Available online at: 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 February 2022).

The Bay Area 2017 Clean Air Plan:

- Describes the BAAQMD plan towards attaining all State and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities
- Defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050
- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve GHG reduction targets
- Includes a wide range of control measures designed to decrease emissions of air pollutants that are most harmful to Bay Area residents, such as particulate matter, O_3, and toxic air contaminants; to reduce emissions of methane and other "Super-GHGs" that are potent climate pollutants in the near term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

BAAQMD CARE Program. The Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that include an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TACs, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and a high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area.

For commercial and industrial sources, the BAAQMD regulates TACs using a risk-based approach. This approach uses an HRA to determine what sources and pollutants to control as well as the degree of control. An HRA is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances, in order to provide a quantitative estimate of health risks.[16] As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. The

[16] In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

BAAQMD has identified seven impacted communities;[17] the City of Fairfield has not been identified as an affected community.[18]

BAAQMD CEQA Air Quality Guidelines. The BAAQMD *CEQA Air Quality Guidelines* were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air pollutant impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and GHG emissions.

In June 2010, the BAAQMD adopted updated draft *CEQA Air Quality Guidelines* and finalized them in May 2011. These guidelines superseded the previously adopted 1999 agency air quality guidelines and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In May 2017, the BAAQMD published an updated version of the *CEQA Air Quality Guidelines*. The BAAQMD *CEQA Air Quality Guidelines* include quantitative thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These thresholds, which are set forth in **Section 4.2.3** below, are appropriate in the context of the size, scale, and location of the proposed project.

4.2.2.4 Local Laws and Regulations

***City of Fairfield General Plan*.** The following policies of the *City of Fairfield General Plan* pertaining to air quality would be applicable to the proposed project:

> **Policy OS 8.2:** Mitigate air pollution from fixed and vehicular sources as required by state and regional air quality plans and programs.
>
> **Policy OS 8.3:** Encourage more efficient use of private vehicles and increased use of mass transit and alternative transportation modes.
>
> **Policy OS 8.5:** Require water conservation and energy efficiency techniques to be incorporated into the design of all development projects.

4.2.3 Significance Criteria

The thresholds for air quality impacts used in this analysis are consistent with Appendix G of the *State CEQA Guidelines*. The proposed project may be deemed to have a significant impact with respect to air quality if it would:

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[17] The seven impacted communities include Richmond/San Pablo; eastern San Francisco, including Treasure Island; San Jose; western Alameda County; Concord, Vallejo; and Pittsburg/Antioch.

[18] BAAQMD. 2014. *Community Air Risk Evaluation Program*. August 20. Available online at: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program (accessed February 2022).

- **Conflict with or obstruct implementation of the applicable air quality plan.**
- **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.**
- **Expose sensitive receptors to substantial pollutant concentrations.**
- **Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.**

According to the BAAQMD *CEQA Air Quality Guidelines*, to meet air quality standards for criteria air pollutant and precursor impacts, the proposed project must not:

- **Contribute to or cause CO concentrations exceeding the State ambient air quality standards;**
- **Generate average daily construction emissions of ROG, NO_x, or $PM_{2.5}$ (exhaust) greater than 54 pounds per day or PM_{10} exhaust emissions greater than 82 pounds per day; or**
- **Generate operational emissions of ROG, NO_x, or $PM_{2.5}$ greater than 10 tons per year or 54 pounds per day; or generate PM_{10} emissions greater than 15 tons per year or 82 pounds per day.**

With respect to project-level impacts from TAC emissions, according to the BAAQMD *CEQA Air Quality Guidelines*, a significant impact would occur if, either during construction or operation, the project would:

- **Expose sensitive receptors to TACs in excess of the following thresholds:**
    - **Increased cancer risk greater than 10.0 in one million;**
    - **Increase non-cancer risk of greater than 1.0 on the hazard index (chronic or acute); or**
    - **Increase ambient $PM_{2.5}$ concentrations greater than 0.3 µg/m^3 annual average.**

A significant cumulative impact would occur if the project, in combination with other projects located within a 1,000-foot radius of the project site, would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 100.0 in one million, an increased non-cancer risk of greater than 10.0 on the hazard index (chronic), or an ambient $PM_{2.5}$ increase greater than 0.8 µg/m^3 on an annual average basis.

Thresholds of significance established by an air district are used to manage total regional and local emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the air basin's projected attainment goals for nonattainment criteria pollutants. As noted earlier, the BAAQMD is currently designated as a nonattainment area for State and national ozone standards and national $PM_{2.5}$ and PM_{10} ambient air quality standards. The Air Basin's nonattainment status is attributed to the region's development

history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the BAAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse impacts to the region's existing air quality conditions.

Because of the conservative nature of the significance thresholds, and the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as O_3 precursors like NO_x and ROG.

4.2.4 Methodology

The proposed project would result in criteria pollutant emissions from construction and operational sources. Construction activities would generate emissions at the project site from off-road construction equipment, and on roadways as a result of construction-related truck hauling, vendor deliveries, and worker commuting. Operational activities would also generate emissions associated with mobile sources (e.g., vehicle and truck trips) and area sources (e.g., consumer products, architectural coatings and the use of landscape maintenance equipment) related to the proposed project. The proposed project would be all-electric and would not generate energy source emissions. This analysis uses the California Emissions Estimator Model version 2020.4.0 (CalEEMod) to quantify criteria pollutant emissions for both construction and operation of the proposed project. CalEEMod output is contained in **Appendix A**.

In addition, to estimate the potential cancer risk and non-cancer health effects associated with construction of the proposed project from equipment exhaust (including diesel particulate matter), a dispersion model was used to translate an emission rate from the source location to a concentration at the receptor location of interest (i.e., a nearby residence and worksites). Model snapshots are included in **Appendix B**.

4.2.5 Project Impacts

This section provides an assessment of the potential impacts related to air quality that could result from implementation of the proposed project. As applicable, conditions of approval (COAs) and mitigation measures are presented to reduce significant impacts.

4.2.5.1 Air Quality Plan Consistency

Impact AQ-1: The project would conflict with or obstruct implementation of the applicable air quality plan.

The applicable air quality plan is the BAAQMD 2017 Clean Air Plan (Clean Air Plan), which defines control strategies to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to 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. Whether the project would conflict with the Clean Air Plan can be determined if the project: (1) does not support the goals of the Clean Air Plan; (2) does not include applicable control measures from the Clean Air Plan; and (3) would disrupt or hinder implementation of control measures from the Clean Air Plan.

Clean Air Plan Goals. The primary goals of the Bay Area Clean Air Plan are to: attain air quality standards; reduce population exposure and protect public health in the Bay Area; and reduce greenhouse gas emissions and protect climate.

The BAAQMD has established quantitative significance thresholds for construction and operational emissions at a level at which the cumulative impact of exceeding these thresholds would have an adverse impact on the Air Basin's ability to attain or maintain air quality standards. The BAAQMD has established health and hazards thresholds to help protect public health. As discussed below, construction and operation of the proposed project would not result in the generation of criteria air pollutants or TACs that would exceed BAAQMD thresholds of significance. Therefore, the proposed project would not conflict with the Clean Air Plan goals.

Clean Air Plan Control Measures. The control strategies of the Clean Air Plan include measures in the following categories: Stationary Source Measures, Transportation Measures, Energy Measures, Building Measures, Agriculture Measures, Natural and Working Lands Measures, Waste Management Measures, Water Measures, and Super-GHG Pollutants Measures. The proposed project's compliance with each of these control measures is discussed below.

Stationary Source Control Measures. The Stationary Source Control Measures, which are designed to reduce emissions from stationary sources such as metal melting facilities, cement kilns, refineries, and glass furnaces, are incorporated into rules adopted by the BAAQMD and then enforced by the BAAQMD Permit and Inspection programs. Since the proposed project would not include any of these stationary sources, the Stationary Source Control Measures of the Clean Air Plan are not applicable to the proposed project.

Transportation Control Measures. The BAAQMD identifies Transportation Control Measures as part of the Clean Air Plan to decrease emissions of criteria pollutants, TACs, and GHGs by reducing demand for motor vehicle travel, promoting efficient vehicles and transit service, decarbonizing transportation fuels, and electrifying motor vehicles and equipment. The proposed project would provide housing near existing business, commercial, and employment centers in the City of Fairfield, reducing the demand for travel by single occupancy vehicles. In addition, the proposed project would install EV charging stations and parking stalls that are

electric vehicle (EV) charging capable. Therefore, the proposed project would promote the use of zero emissions vehicles by the project residents and would promote initiatives to reduce vehicle trips and vehicle miles traveled (VMT) by design as well as by implementing **Mitigation Measure TRA-1** as provided in **Section 4.12: Transportation,** of this EIR. Please refer to that section for additional discussion. Therefore, the proposed project would not conflict with the identified Transportation and Mobile Source Control Measures of the Clean Air Plan.

Energy Control Measures. The Clean Air Plan also includes Energy Control Measures, which are designed to reduce emissions of criteria air pollutants, TACs, and GHGs by decreasing the amount of electricity consumed in the Bay Area, as well as decreasing the carbon intensity of the electricity used by switching to less GHG-intensive fuel sources for electricity generation. Since these measures apply to electrical utility providers and local government agencies (and not individual projects), the energy control measures of the Clean Air Plan are not applicable to the proposed project.

Building Control Measures. The BAAQMD has authority to regulate emissions from certain sources in buildings such as boilers and water heaters, but has limited authority to regulate buildings themselves. Therefore, the strategies in the control measures for this sector focus on working with local governments that do have authority over local building codes, to facilitate adoption of best control practices and policies. The proposed project would be required to comply with the latest Title 24 standards of the California Code of Regulations, established by the California Energy Commission (CEC), regarding energy conservation and green building standards. In addition, the proposed project would include the following sustainability features: a minimum of 15 percent of the roof areas would be reserved for future photovoltaic (PV) solar installation; the building would be equipped with automated electrical lighting controls and occupancy sensor technology; all appliances would be electric and ENERGY STAR certified; all water fixtures (faucets, showerheads, and toilets) would be low flow and/or WaterSense certified for low water use; windows would be treated with energy efficient low emissivity (Low-E) coatings; paint would have reduced amounts of volatile organic compounds (low VOC) and be Leadership in Energy and Environmental Design (LEED) version 4 qualified; heating, ventilation, and air conditioning (HVAC) equipment would consist of high-efficiency ENERGY STAR certified condensing units with a seasonal energy efficiency rating (SEER) of 15; roofing material would include an ENERGY STAR rated thermoplastic polyolefin (TPO) membrane to reflect ultraviolet rays and heat from the building; high-efficiency central heat pump boiler system would be installed for efficient hot water distribution throughout the residential building; floor systems would be fully insulated, and 2-inch by 6-inch exterior walls would provide added building insulation; energy efficient light-emitting diode (LED) light fixtures would be installed in the apartment building and for exterior lighting; and new landscape plants would be drought tolerant, native to California or other Mediterranean climates, or other low water use species. Therefore, the proposed project would not conflict with any of the Building Control Measures.

Agriculture Control Measures. The Agriculture Control Measures are designed to primarily reduce emissions of methane. Since the proposed project does not include any agricultural activities, the Agriculture Control Measures of the Clean Air Plan are not applicable to the proposed project.

Natural and Working Lands Control Measures. The Natural and Working Lands Control Measures focus on increasing carbon sequestration on rangelands and wetlands, as well as encouraging local governments to adopt ordinances that promote urban-tree plantings. As discussed in **Section 4.3: Biological Resources**, an approximately 0.11-acre seasonal wetland was mapped on the project site. The proposed project would permanently impact the seasonal wetland as a result of the building footprint and associated internal vehicle circulation and parking. With the implementation of **Mitigation Measure BIO-8**, provided in **Section 4.3: Biological Resources**, of this EIR, potential impacts to State and federally-protected wetlands would be less than significant. In addition, as discussed in that section, the proposed project would not conflict with the City's tree ordinance. Therefore, the proposed project would not conflict with the Natural and Working Lands Control Measures of the Clean Air Plan.

Waste Management Control Measures. The Waste Management Control Measures focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic materials away from landfills, and increasing waste diversion rates through efforts to reduce, reuse, and recycle. The proposed project would comply with local requirements for waste management (e.g., recycling and composting services). Therefore, the proposed project would be consistent with the Waste Management Control Measures of the Clean Air Plan.

Water Control Measures. The Water Control Measures focus on reducing emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works (POTWs), and promoting the use of biogas recovery systems. Since these measures apply to POTWs and local government agencies (and not individual projects), the Water Control Measures are not applicable to the proposed project. The project would minimize water use by installing water fixtures (faucets, showerheads, and toilets) that are low flow and/or WaterSense certified for low water use. Landscape plants that are planted on the project site would be drought tolerant, native to California or other Mediterranean climates, or other low water use species.

Super GHG Control Measures. The Super-GHG Control Measures are designed to facilitate the adoption of best GHG control practices and policies through the BAAQMD and local government agencies. Since these measures do not apply to individual projects, the Super-GHG Control Measures are not applicable to the proposed project.

Clean Air Plan Implementation. As discussed above, the proposed project would generally implement the applicable measures outlined in the Clean Air Plan, including Transportation Control Measures. Therefore, the proposed project would not disrupt or hinder implementation of a control measure from the Clean Air Plan. As such, this impact would be less than significant.

Level of Significance prior to Mitigation: Potentially Significant

Mitigation Measures: Implement Mitigation Measures TRA-1 and BIO-8.

Level of Significance after Mitigation: Less than Significant

4.2.5.2 Cumulatively Considerable Net Increases of Criteria Pollutants

Impact AQ-2: Construction of the proposed project would result in a cumulatively considerable net increase in criteria pollutants for which the project region is non-attainment under an applicable federal or State ambient air quality standard.

The BAAQMD is currently designated as a nonattainment area for State and national ozone standards and national $PM_{2.5}$ and PM_{10} ambient air quality standards. The potential for project construction activities to generate emissions of these criteria pollutants in excess of thresholds is analyzed below. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by grading, paving, building, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly emitted $PM_{2.5}$ and PM_{10}, and TACs such as diesel exhaust particulate matter.

Project construction activities would include excavation, site preparation, grading, building, paving, and architectural coating (painting). Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at 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 and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The BAAQMD has established standard measures for reducing fugitive dust emissions (PM_{10}). With the implementation of these Basic Construction Mitigation Measures recommended by the BAAQMD and required by local conditions of approval, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, ROG, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using the California Emissions Estimator Model (CalEEMod) version 2020.4.0, consistent with BAAQMD recommendations. The proposed project would include the excavation of 770 tons of material to be hauled offsite, which was included in CalEEMod. In addition, the proposed project would require approximately 1,750 cubic yards of cut and 12,050 cubic yards of fill, for a net of 10,300 cubic yards of fill that would be imported to the project site, which was included in CalEEMod. Construction of the proposed project is anticipated to begin in Summer 2023 and end in Spring 2025. Based on information provided by

the project applicant, construction of the proposed project would result in a maximum of 150 worker trips per day, which was included in CalEEMod. The project applicant also provided construction fleet details, which were included in CalEEMod. This analysis assumes the use of Tier 2 construction equipment. Construction-related emissions are presented in **Table 4.2.E: Project Construction Emissions in Pounds Per Day**. CalEEMod output sheets are included in **Appendix A.**

Table 4.2.E: Project Construction Emissions in Pounds Per Day

Project Construction	ROG	NO_x	Exhaust PM_{10}	Fugitive Dust PM_{10}	Exhaust $PM_{2.5}$	Fugitive Dust $PM_{2.5}$
Average Daily Emissions	5.8	17.2	0.5	1.1	0.5	0.3
BAAQMD Thresholds	54.0	54.0	82.0	BMP	54.0	BMP
Exceed Threshold?	**No**	**No**	**No**	**Yes**	**No**	**Yes**

Source: LSA (2022).
BAAQMD = Bay Area Air Quality Management District
BMP = Best Management Practices
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in aerodynamic diameter
ROG = reactive organic gases

As shown in **Table 4.2.E**, construction emissions associated with the project would not exceed the BAAQMD's thresholds for ROG, NO_x, CO, exhaust PM_{10}, and exhaust $PM_{2.5}$ emissions. However, in addition to the construction period thresholds of significance, the BAAQMD requires the implementation of the BAAQMD's Basic Construction Mitigation Measures to reduce construction fugitive dust impacts to a less-than-significant level. Absent the implementation of BAAQMD's Basic Construction Mitigation Measures, the proposed project's construction-phase impact related to particulate matter would be significant. **Mitigation Measure AQ-1**, as identified below, would require the implementation of the BMPs recommended by the BAAQMD to mitigate dust/particulate matter impacts. With the implementation of **Mitigation Measure AQ-1**, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standards (AAQS).

Level of Significance prior to Mitigation: Potentially Significant

Mitigation Measures: The following mitigation measure would be implemented to reduce the impact associated with construction fugitive dust impacts during project construction:

MM AQ-1 Consistent with Bay Area Air Quality Management District (BAAQMD) Basic Construction Mitigation Measures, the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-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 shall be limited to 15 miles per hour.
- 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.
- 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 [CCR]). 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 at the City of Fairfield regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Level of Significance after Mitigation: Less than Significant

Impact AQ-3: Operation of the proposed project would not result in a cumulatively considerable net increase in any criteria pollutants for which the project region is non-attainment under an applicable federal or State ambient air quality standard.

Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle and truck trips), energy sources (e.g., natural gas), and area sources (e.g., consumer products, architectural coatings, and the use of landscape maintenance equipment) related to the proposed project.

PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement, and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other PM emission processes.

Gasoline-powered engines have small rates of particulate matter emissions in their exhaust compared with diesel-powered vehicles.

Energy source emissions result from activities in buildings for which natural gas is used. The quantity of emissions is the product of usage intensity (i.e., the amount of natural gas) and the emission factor of the fuel source. The proposed project would be all-electric; therefore, the proposed project would not generate energy source emissions. Area source emissions associated with the project would include emissions from the use of landscaping equipment, consumer products, and architectural coatings.

Long-term operational emissions associated with the proposed project were calculated using CalEEMod. Trip generation rates used in CalEEMod for the project were based on the project's trip generation estimates, which assume the proposed project would typically generate approximately 840 average daily trips (refer to **Section 4.12: Transportation**, for trip generation estimates). As identified above, the proposed project would be all-electric, which was included in CalEEMod. In addition, the proposed project would install LED lighting, ENERGY STAR appliances, PV solar installation, low-flow plumbing, water-efficient landscaping, which was included in CalEEMod. When project-specific data were not available, default assumptions in CalEEMod were used to estimate project emissions. Model results are shown in **Table 4.2.F: Project Operational Emissions**. CalEEMod output sheets are included in **Appendix A.**

Table 4.2.F: Project Operational Emissions

	ROG	NO_x	PM_{10}	$PM_{2.5}$
Pounds Per Day				
Area Source Emissions	6.2	0.2	0.1	0.1
Energy Source Emissions	0.0	0.0	0.0	0.0
Mobile Source Emissions	1.9	1.8	3.1	0.8
Total Emissions	**8.1**	**2.0**	**3.2**	**0.9**
BAAQMD Thresholds	54.0	54.0	82.0	54.0
Exceed Threshold?	**No**	**No**	**No**	**No**
Tons Per Year				
Area Source Emissions	1.1	<0.1	<0.1	<0.1
Energy Source Emissions	0.0	0.0	0.0	0.0
Mobile Source Emissions	0.3	0.3	0.5	0.1
Total Emissions	**1.4**	**0.4**	**0.6**	**0.2**
BAAQMD Thresholds	10.0	10.0	15.0	10.0
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: LSA (2022)
BAAQMD = Bay Area Air Quality Management District
BMP = Best Management Practices
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in aerodynamic diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in aerodynamic diameter
ROG = reactive organic gases

The primary emissions associated with the project are regional in nature, meaning that air pollutants would rapidly disperse on release or, in the case of vehicle emissions associated with the project,

emissions would be released in other areas of the Air Basin. The daily and annual emissions associated with project operational trip generation, energy, and area sources are identified in **Table 4.2.F** for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

The results in **Table 4.2.F** indicate that project emissions would not exceed the significance criteria for daily or annual ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions. The operation of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Localized CO Emissions. Emissions and ambient concentrations of CO have decreased dramatically in the Bay Area with the introduction of the catalytic converter in 1975. No exceedances of the State or federal CO standards have been recorded at Bay Area monitoring stations since 1991. BAAQMD CEQA Guidelines include recommended methodologies for quantifying concentrations of localized CO levels for proposed development projects.

A screening level analysis using guidance from the BAAQMD *CEQA Air Quality Guidelines* was performed to determine the impacts of the project. The screening methodology provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD *CEQA Air Quality Guidelines*, a proposed project would result in a less-than-significant impact related 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.

- 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 Air Basin has been designated attainment under both the national and California AAQS for CO. Therefore, the proposed project would not have the potential to substantially increase CO hotspots at intersections in Fairfield.

Implementation of the proposed project would not conflict with the Solano County Transportation Authority's congestion management program for designated roads or highways, a regional transportation plan, or other agency plans. As further discussed in **Section 4.12: Transportation**, the proposed project would generate approximately 68 AM and 74 PM peak hour trips; therefore, the project's contribution to peak hour traffic volumes at intersections in the vicinity of the project site would be well below 44,000 vehicles per hour. Therefore, the proposed project would not result in localized CO concentrations that exceed State or federal standards and this impact would be less than significant.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

4.2.5.3 Sensitive Receptor Exposure to Air Pollutant Emissions

Impact AQ-4: Project operation would not expose sensitive receptors to substantial pollutant concentrations; however, emissions from project construction activities would exceed applicable thresholds.

As previously discussed, sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. Exposure from diesel exhaust associated with construction activity would have the potential to contribute to both cancer risk, and non-cancer (chronic and acute) health risks.

As noted in **Section 4.2.3** above, according to the BAAQMD, a project would result in a significant impact related to TAC exposure if it would: individually expose sensitive receptors to TACs resulting in an increased cancer risk greater than 10.0 in one million, increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute), or an annual average ambient $PM_{2.5}$ increase greater than 0.3 µg/m^3.

Increased community risk can occur from the introduction of a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. Potential adverse effects associated with the proposed project are discussed below.

Project Construction – Toxic Air Contaminants. The project site is located near existing residential uses that could be exposed to diesel exhaust emissions during the construction period (Although there are other receptors such as an assisted living facility and a medical center to the northeast of the project site, those are too distant to be affected by project construction emissions). The closest existing sensitive receptors include the single-family residences along Malvasia Court and Bianco Circle located immediately north of the project site boundary. A construction health risk assessment (HRA), which evaluates construction-period health risk to off-site receptors, was performed for the proposed project, and the analysis is presented below.

To estimate the potential health risk associated with construction of the proposed project from equipment exhaust (including diesel particulate matter), a dispersion model was used to translate an emission rate from the source location to a concentration at the receptor location of interest (i.e., a nearby residence and worksites). Dispersion modeling can vary from a simpler, more conservative screening-level analysis to a more complex and refined detailed analysis. For this project, a refined assessment was conducted using the CARB exposure methodology with the air dispersion modeling performed using the USEPA dispersion model AERMOD. The model provides an estimate of exhaust concentrations based on site and source geometry, source emissions strength,

distance from the source to the receptor, and meteorological data. The CARB HARP model was then used to translate the pollutant concentrations from AERMOD into estimated health risks at the nearby sensitive receptor locations.

Table 4.2.G: Unmitigated Inhalation Health Risks from Project Construction to Off-Site Receptors below, identifies the results of the analysis assuming the use of Tier 2 construction equipment, as proposed by the project, at the maximally exposed individual (MEI), which is the nearest sensitive receptor. Model snap shots of the sources are shown in **Appendix B** of this EIR.

Table 4.2.G: Unmitigated Inhalation Health Risks from Project Construction to Off-Site Receptors

Project Construction	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Maximally Exposed Individual	21.10	0.018	0.087
Threshold	**10.0**	**1.0**	**0.30**
Exceed?	**Yes**	**No**	**No**

Source: LSA (2022).
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
$\mu g/m^3$ = micrograms per cubic meter

As shown in **Table 4.2.G**, the risk associated with project construction at the MEI would be 21.10 in one million, which would exceed the BAAQMD cancer risk of 10 in one million. The total chronic inhalation hazard index would be 0.018, which is below the threshold of 1.0. In addition, the results of the analysis indicate that the total $PM_{2.5}$ concentration would be 0.087 $\mu g/m^3$, which would also not exceed the BAAQMD significance threshold of 0.30 $\mu g/m^3$.

As indicated above, the cancer risk of 21.1 in one million due to project construction would exceed the BAAQMD threshold. Therefore, implementation of cleaner construction equipment would be required. Implementation of **Mitigation Measure AQ-2**, which is identified below and would require all off-road diesel-powered construction equipment of 50 horsepower or more used for project construction to meet the equivalent of CARB Tier 2 emissions standards with Level 3 diesel particulate filters, would reduce substantial pollutant concentrations during project construction.

Table 4.2.H: Mitigated Inhalation Health Risks from Project Construction to Off-Site Receptors identifies the results of the analysis with implementation of **Mitigation Measure AQ-2**.

As shown in **Table 4.2.H**, the mitigated cancer risk at the MEI would be 3.67 in one million, which would not exceed the BAAQMD cancer risk threshold of 10 in one million. Therefore, with the implementation of **Mitigation Measure AQ-2**, construction of the proposed project would not exceed BAAQMD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations and this impact would be less than significant with mitigation.

Table 4.2.H: Mitigated Inhalation Health Risks from Project Construction to Off-Site Receptors

Project Construction	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Maximally Exposed Individual	3.67	0.003	0.015
Threshold	**10.0**	**1.0**	**0.30**
Exceed?	**No**	**No**	**No**

Source: LSA (2022).
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
$\mu g/m^3$ = micrograms per cubic meter

Project Operation – Toxic Air Contaminants. The proposed project does not include any operational sources of TACs and therefore would not expose nearby existing receptors to any long-term substantial pollutant concentrations. There would be no impact.

As discussed in *California Building Industry Association v. BAAQMD*, 62 Cal.4th 369, the California Supreme Court held that CEQA generally does not require analysis or mitigation of the impact of existing environmental conditions on a project, including a project's future users or residents. However, as with other laws and regulations enforced by other agencies that protect public health and safety, the City as the lead agency has authority outside of CEQA (through its police powers) to require measures to protect public health and safety. Therefore, this document includes an assessment of the proposed project's potential to expose future project sensitive receptors to substantial pollutant concentrations by individual exposure to the existing sources of TACs in the project vicinity.

Based on a search of stationary sources permitted by the BAAQMD using the Stationary Source Screening Analysis Tool, there are no stationary sources of TACs within 1,000 feet of the project site. In addition, high volume freeways are more than 1,000 feet from the project site. Therefore, implementation of the project would not expose sensitive receptors to substantial pollutant concentrations associated with nearby stationary and mobile sources of TACs and this impact would be less than significant.

Level of Significance prior to Mitigation: Potentially Significant

Mitigation Measures: The following mitigation measure would be implemented to reduce the impact associated with construction equipment TAC emissions during project construction:

MM AQ-2 During construction of the proposed project, the project contractor shall ensure all off-road diesel-powered construction equipment of 50 horsepower or more used for project construction at a minimum meets the California Air Resources Board Tier 2 emissions standards and is equipped with Level 3 diesel particulate filters or the equivalent.

Level of Significance after Mitigation: Less than Significant

4.2.5.4 Odors

Impact AQ-5: The proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the project site. The potential for diesel odor impacts is therefore considered less than significant.

Odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. The BAAQMD considers a significant odor impact as a substantial number of odor complaints, specifically, more than five confirmed complaints per year average over the past three years. Examples of land uses that have the potential to generate considerable odors include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants.

The proposed project is not expected to produce any offensive odors that would result in frequent odor complaints. The proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people during project construction or operation, and this impact would be less than significant. No mitigation is required.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

4.2.5.5 Cumulative Impacts

Cumulative Impact C-AQ-1: The proposed project, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in a significant cumulative impact on air quality.

The BAAQMD is currently designated as a nonattainment area for State and national ozone standards and national particulate matter ambient air quality standards. BAAQMD nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

As noted earlier, in developing thresholds of significance for air pollutants, the BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively

considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, if the proposed project's daily average or annual emissions of construction- or operational-related criteria air pollutants exceed any applicable threshold set forth by the BAAQMD, the proposed project would result in a considerable contribution to a cumulatively significant impact.

As shown in **Table 4.2.F**, implementation of the proposed project would not generate operational emissions that would exceed BAAQMD thresholds. As the operation of the proposed project would not result in individually significant impacts, the proposed project would not result in a cumulatively considerable contribution to regional air quality impacts. Cumulative impacts would be considered less than significant.

With regard to project construction activities, with the exception of construction-phase dust/particulate matter, the proposed project would not result in criteria pollutant emissions that would exceed the applicable thresholds. Furthermore, the construction-phase dust emissions would be controlled with the implementation of the proposed mitigation. Similarly, although construction phase TAC emissions would have the potential to result in a significant health risk to nearby receptors, TAC emissions would be controlled with the implementation of the proposed mitigation. With the exception of the Residence Inn hotel project, none of the other related projects (see **Table 4.A: Cumulative Projects in the Vicinity of the Project Site** in **Chapter 4.0: Environmental Setting, Impacts, and Mitigation Measures**) are in within 1,000 feet of the proposed project and their construction-phase emissions, including dust/particulate matter emissions, would not combine with those of the proposed project to cumulatively affect the receptors near the project site. Although the hotel project is adjacent to the project site, since its construction has already commenced, construction activities would be completed before the grading on the project site is commenced. Therefore, dust, other criteria pollutants and TAC emissions from that project would not combine with those generated by the proposed project. There would be no cumulative impacts during project construction.

In summary, cumulative air quality impacts of the proposed project would be considered less than significant.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

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