Section 3.2
Air Quality

Summary

Table 3.2-1 below provides a summary of the potential environmental impacts of the Proposed Project related to air quality. As shown in Table 3.2-1, the Proposed Project would have significant but mitigable impacts related to construction emissions and less than significant operational emission impacts.

Table 3.2-1. Summary of Potential Impacts on Air Quality

Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact AIR-1: Conforms with Implementation of Air Quality Attainment Plan	Less Than Significant Impact	Mitigation not required.	N/A
Impact AIR-2: Generation of PM10 and Construction Vehicle Exhaust Emissions	Significant Impact	Mitigation Measure AIR-2: Implement Dust and Vehicle Emission Control Measures	Less Than Significant
Impact AIR-3: Increase in Ozone Precursor (ROG and NO_X) and PM2.5 emissions during Project Operation	Less Than Significant Impact	Mitigation not required.	N/A
Impact AIR-4: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations of CO	Less Than Significant Impact	Mitigation not required.	N/A
Impact AIR-5: Expose Sensitive Receptors to Substantial Pollutant Concentrations	Less Than Significant Impact	Mitigation not required.	N/A
Impact AIR-6: Expose Sensitive Receptors to Objectionable Odors	Less Than Significant Impact	Mitigation not required.	N/A

Introduction

This section provides information on the existing air quality at the Proposed Project site. It includes a discussion of federal and state ambient air quality standards, and the overall regulatory framework for air quality management in the region. Potential impacts of the Proposed Project on air quality are identified, and mitigation measures are proposed to reduce impacts to a less-than-significant level where possible. This section discusses impacts related to criteria pollutants and toxic air contaminants. Greenhouse gas emissions are discussed separately in Section 3.4, Climate Change.

Regulatory Setting

The project site, located in Alameda County, lies within the San Francisco Bay Area Air Basin (SFBAAB). Air quality within the SFBAAB is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is responsible for implementing emissions standards and administers air quality regulations developed at the federal, state, and local levels. Federal, state, and local air quality regulations applicable to the Proposed Project are described below.

Federal

The federal Clean Air Act, promulgated in 1970 and amended twice thereafter (including the 1990 amendment), establishes the framework for modern air pollution control. The Act directs the EPA to establish ambient air standards for six pollutants: ozone (O_3), carbon monoxide (CO), lead, nitrogen dioxide (NO_2), particulate matter, and sulfur dioxide (SO_2). The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to state and local agencies.

The EPA has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Criteria pollutants include CO, NO_2, SO_2, O_3, particulate matter less than 2.5 and 10 microns in diameter (PM2.5 and 10), and lead.

Areas that do not meet the federal NAAQS are called “nonattainment” areas. For these nonattainment areas, the federal Clean Air Act requires each state to develop and adopt a state implementation plan (SIP); i.e., a plan showing how air quality standards will be attained. The SIP, which is reviewed and approved by the EPA, must demonstrate how federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. In cases where a SIP is submitted by a state but fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan. In California, the EPA has given responsibility for preparing SIPs to the California Air Resources Board (ARB), which, in turn, has delegated the task to individual air districts.

State

Maintaining California's air quality standards, which are more stringent than federal standards, is the responsibility of the ARB and local air pollution control districts and is to be achieved through district-level air quality management plans that will be incorporated into the SIP.

The ARB has traditionally established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving state implementation plans.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA.

California Clean Air Act

The California Clean Air Act of 1988 (CCAA) substantially added to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. It focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

The California CAA requires designation of attainment and nonattainment areas with respect to state ambient air quality standards. If the district violates state air quality standards for carbon monoxide, sulfur dioxide, nitrogen dioxide, or O_3, the California CAA also requires that local and regional air districts expeditiously prepare an air quality attainment plan. These plans, specifically designed to attain state standards, must be designed to achieve an annual five percent reduction in district-wide emissions of each nonattainment pollutant or its precursors. No locally prepared attainment plans are required for areas that violate state PM10 standards.

The California CAA requires that the state air quality standards be met as expeditiously as practicable but, unlike the federal CAA, does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

The California CAA emphasizes the control of *indirect and area-wide sources* of air pollutant emissions. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCM). Although the California CAA does not define *indirect and area-wide sources,* Section 110 of the federal CAA defines an indirect source as "…a facility, building, structure, installation, real property, road, or highway, which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply."

TCMs are defined in the California CAA as "any strategy to reduce trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing vehicle emissions."

Recently enacted amendments to the California CAA impose additional requirements designed to ensure an improvement in air quality within the next five years. More specifically, local districts with moderate air pollution that had not achieved "transitional nonattainment" status by December 31, 1997 must have implemented the more stringent measures applicable to districts with serious air pollution.

California Toxic Air Contaminants

California regulates TACs primarily through the Tanner Air Toxics Act (AB1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588).

The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. To date, ARB has identified 21 TACs, and has also adopted EPA's list of HAPs as TACs. Since August 1998, diesel particulate matter (DPM) was added to the ARB list of TACs (ARB 1998).

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels: (1) prepare a toxic emission inventory; (2) prepare a risk assessment if emissions are significant (i.e. 10 tons per year or on District's HRA list); (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

In September 2000, the ARB approved the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan) (ARB 2000). The Diesel Risk Reduction Plan outlines a comprehensive and ambitious program that includes the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). According to the Plan, ARB will work with the heavy-duty truck companies and operators to develop an emission reduction program for trucks.

San Francisco Bay Area Air Basin

The BAAQMD has jurisdiction over air quality issues within the SFBAAB. Air pollution control programs were established in California before federal requirements were enacted. However, federal CAA legislation in the 1970s resulted in a gradual merging of state and federal air quality programs, particularly those relating to industrial sources. Air quality management programs developed by California since the late 1980s have generally responded to requirements established by the federal CAA.

The enactment of the California CAA in 1988 and the federal CAA Amendments of 1990 has produced additional changes in the structures and administration of air quality management programs. The California CAA requires preparation of an air quality attainment plan for any area that violates state standards for CO, SO_2, NO_2, or O_3. Locally prepared attainment plans are not required for areas that violated the state standards for PM10, but the ARB is currently addressing PM10 attainment issues.

All areas designated as non-attainment under the CCAA are required to prepare plans showing how the area would meet the State air quality standards by its attainment dates. The Air Quality Attainment Plan (AQAP) is the region's plan for improving air quality. It addresses the California CAA and CCAA requirements and demonstrates attainment with ambient air quality standards. The BAAQMD prepared the 2005 Bay Area Ozone Strategy. The Ozone Strategy is a roadmap showing how the region will continue to make progress toward meeting the State one-hour ozone standard and how the region will reduce transport of ozone and ozone precursors to neighboring air basins.

The Ozone Strategy was prepared in compliance with the CCAA. The California CAA requires a triennial update to the Ozone Strategy. The BAAQMD is currently in the process of updating the 2005 Ozone Strategy in accordance with the requirements of the CCA to implement all feasible measures to reduce ozone.

In March 2010, BAAQMD released the Draft Bay Area 2010 Clean Air Plan (CAP) as well as the Draft Programmatic EIR on the CAP. The public comment period ended on April 26, 2010. The 2010 is the update to the 2005 Ozone Strategy.

In addition, the federal 24-hour PM2.5 standard was lowered from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006, and the EPA issued their final attainment status designations for the 35 $\mu g/m^3$ standard on October 8, 2009. The BAAQMD was designated as nonattainment for PM2.5, and this designation became effective on December 14, 2009. The District has three years from the effective date (December 14, 2012) to submit to develop and submit a SIP.

SB 656 requires the ARB, in consultation with local air quality districts, to develop and adopt a list of the most readily available, feasible, and cost-effective control measures that could be used by CARB and air districts to reduce particulate matter. To comply with the requirements of SB 656, the BAAQMD has adopted a PM Implementation Schedule for appropriate CARB and air district measures to reduce public exposure to PM_{10} and $PM_{2.5}$ and to make progress toward attainment of state and national PM_{10} and $PM_{2.5}$ standards. On November 16, 2005, the BAAQMD's Board of Directors adopted a Particulate Matter Implementation Schedule, based on the BAAQMD's review of the list of 103 potential PM control measures prepared by the CARB.

On June 2, 2010, the BAAQMD adopted new CEQA Air Quality Guidelines and CEQA thresholds of significance, which were effective on June 2, 2010. In addition, the new risk and hazards thresholds for new receptors are effective on June 2, 2011. However, it is the BAAQMD policy that the new thresholds only apply to projects for which a Notice of Preparation is published, or environmental analysis begins, on or after the applicable effective date (BAAQMD 2010a). The Notice of Preparation for the Proposed Project was issued on April 17, 2008, and the environmental analysis began soon thereafter. As such, the Proposed Project is not required to comply with the new CEQA criteria air pollutant or risk and hazard thresholds and the prior CEQA guidelines are used in this document.

Environmental Setting

The Proposed Project area is located in southern Alameda County. This region encompasses the low-lying area on the southeast side of the San Francisco Bay, south of Highway 580/Dublin Canyon and north of the City of Milpitas. The region is bordered on the east by the East Bay Hills and on the west by the San Francisco Bay. Most of the area is very flat.

Situated between the western and eastern portions of the Coast Range, this region is protected from the direct effects of the marine air flow. Marine air entering through the Golden Gate is forced to diverge into northerly and southerly paths because of the blocking effect of the east bay hills. The southern flow is directed southeasterly down the bay, parallel to the hills, where eventually it passes over southwestern Alameda County. These sea breezes are strongest in the afternoon. The further from the ocean the marine air travels, the more it is modified. Thus, although the climate in this region is affected by sea breezes, it is affected less so than the regions closer to the Golden Gate, to the north.

The climate of southwestern Alameda County is also modified by its close proximity to the San Francisco Bay. Evaporation from the bay will cool the air in contact with it during warm weather, while during cold weather, the bay can act as a heat source. The normal northwest wind pattern will then carry this air onshore. During periods of flat pressure gradients, the bay can generate its own circulation system. This bay breeze, similar to the sea breeze, pushes cool air onshore during the daytime and draws air from the land offshore at night. Bay breezes are common in the morning, before the sea breeze begins.

Winds are predominantly out of the northwest quadrant in this region, particularly during summer months. In the winter, winds are equally likely out of the east. Cold air over land areas creates high pressure to the east, which forces air toward the west. Easterly surface flow into southern Alameda County passes through three major gaps: Hayward/Dublin Canyon, Niles Canyon, and Mission Pass. Areas north of the gaps then experience southeast winds, while areas south of the gaps experience northeast winds. Wind speeds are moderate in this region. Annual average wind speeds close to the bay are about 7 miles per hour (mph), while further inland near the City of Fremont, they are 6 mph.

Air temperatures are moderated by both the proximity to the bay and to the sea breeze. Temperatures in this region are slightly cooler in the winter and slightly warmer than east bay cities to the north. Average daily maximum temperatures in winter in the Union City area in the high 50's to 60 degrees. During the summer months, average daily maximum temperatures are in the mid 60's. Average minimum temperatures are in the low 40's in winter and mid-50's in the summer (BAAQMD 2008).

Rainfall amounts in the region are lower than other east bay sites to its north. Areas near the bay, such as Union City have lower rainfall amounts because of the rain shadow effect of the Santa Cruz Mountains. Union City's annual rainfall is 14 inches. Areas closer to the hills have higher rainfall amounts because they are further from the Santa Cruz Mountains and because of orographic effects. That is, air that is forced to ascend the mountains will cool and condense, leading to increased rain.

Pollution potential is relatively high in this region during summer and fall months. When high pressure dominates the weather, low mixing depths and bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to the locally emitted pollutants. The polluted air is then pushed up against the East Bay Hills. Flow eastward through the gaps is weak because winds in the Livermore Valley are usually from the east. Wintertime pollution levels are only moderate.

Criteria Pollutants and Local Air Quality

Pollutants and Effects

Criteria Pollutants

Air quality studies generally focus on five pollutants that are most commonly measured and regulated: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM10, and PM2.5).

Carbon Monoxide

CO is a colorless and odorless gas, which can interfere with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, CO is emitted by motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. Automobile exhausts release most of the CO in urban areas. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February.

Ozone

O_3 is a colorless toxic gas, which is the chief component of urban smog. It enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. It also damages vegetation by inhibiting their growth. Although O_3 is not directly emitted, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and NO_X under sunlight. The damaging effects of photochemical smog are generally related to the concentration of O_3. Meteorology and terrain play major roles in O_3 formation. Ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. The greatest source of smog-producing gases is the automobile.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a brownish gas that irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM10 (see discussion of PM10 below). At atmospheric concentration, NO_2 is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 parts per million (ppm).

Sulfur Dioxide

SO_2 is a product of high-sulfur fuel combustion. Main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also cause plant leaves to turn yellow, as well as erode iron and steel. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 concentrations have been reduced to levels well below the state and national standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM10, of which SO_2 is a contributor.

Health Effects of Criteria Air Pollutants

Exposure to high concentrations of air pollutants can trigger respiratory diseases, such as asthma, bronchitis, and other respiratory ailments; and cardiovascular diseases. A healthy person exposed to high concentrations of air pollutants may be become nauseated or dizzy, may develop a headache or cough, or may experience eye irritation and/or a burning sensation in the chest. Ozone is a powerful irritant that attacks the respiratory system, leading to the damage of lung tissue. Inhaled particulate matter, nitrogen dioxide, and sulfur dioxide can directly irritate the respiratory tract, constrict airways, and interfere with the mucous lining of the airways. Exposure to carbon monoxide, when absorbed into the bloodstream, can endanger the hemoglobin, the oxygen-carrying protein in blood, by reducing the amount of oxygen which reaches the heart, brain, and other body tissues. When air pollutants levels are high, a common occurrence in California, children, elderly, and people with respiratory problems are advised to remain indoors. Outdoor exercise also is discouraged because strenuous activity may cause shortness of breath and chest pains. A brief discussion of the criteria pollutants and their effect on human health and the environment is provided in Table 3.2-2.

Table 3.2-2. Health Effects Summary of the Major Criteria Air Pollutants

Pollutants	**Sources**	**Primary Effects**
Ozone	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	▪ Aggravation of respiratory and cardiovascular diseases. ▪ Irritation of eyes. ▪ Impairment of cardiopulmonary function. ▪ Plant leaf injury.
Nitrogen Dioxide (NO_2)	▪ Motor vehicle exhaust. ▪ High temperature stationary combustion. ▪ Atmospheric reactions.	▪ Aggravation of respiratory illness. ▪ Reduced visibility. ▪ Reduced plant growth. ▪ Formation of acid rain.
Carbon Monoxide (CO)	▪ Incomplete combustion of fuels and other carbon containing substances, such as motor exhaust. ▪ Natural events, such as decomposition of organic matter.	▪ Reduced tolerance for exercise. ▪ Impairment of mental function. ▪ Impairment of fetal development. ▪ Death at high levels of exposure. ▪ Aggravation of some heart diseases (angina).
Particulate Matter (PM2.5 and PM10)	▪ Stationary combustion of solid fuels. ▪ Construction activities. ▪ Industrial processes. ▪ Atmospheric chemical reactions.	▪ Reduced lung function. ▪ Aggravation of the effects of gaseous pollutants. ▪ Aggravation of respiratory and cardio-respiratory diseases. ▪ Increased cough and chest discomfort. ▪ Soiling. ▪ Reduced visibility.
Sulfur Dioxide (SO_2)	▪ Combustion of sulfur-containing fossil fuels. ▪ Smelting of sulfur bearing metal ores. ▪ Industrial processes.	▪ Aggravation of respiratory diseases (asthma, emphysema). ▪ Reduced lung function. ▪ Irritation of eyes. ▪ Reduced visibility. ▪ Plant injury. ▪ Deterioration of metals, textiles, leather, finishes, coatings, etc.

Pollutants	Sources	Primary Effects
Lead (Pb)	Contaminated soil.	▪ Impairment of blood function and nerve construction. ▪ Behavioral and hearing problems in children.
Source: CARB 2008.		

Toxic Air Contaminants

Although ambient air quality standards exist for criteria pollutants, no standards exist for toxic air contaminants (TACs). TACs are a category of air pollutants that have been shown to have an impact on human health but are not classified as criteria pollutants. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the Air Resources Board (ARB) has consistently found there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor called a Hazard Index is used to evaluate risk. In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. Air toxics are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, and combustion sources; mobile sources, such as diesel trucks, ships and trains; and area sources, such as farms, landfills, and construction sites. Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. In 1998, the ARB identified diesel particulate matter (DPM) as a carcinogen (CARB 1998).

Background Air Quality

Federal and State Ambient Air Quality Standards

The federal and state governments have established ambient air quality standards for six pollutants called “criteria” pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM 10 and PM 2.5) and lead (see Table 3.2-3). The State of California has also established ambient standards for lead, hydrogen sulfide (H_2S), vinyl chloride, and sulfates. Ozone and NO_2 are considered to be regional pollutants because they or their precursors affect air quality on a regional scale: NO_2 reacts photochemically with reactive organic gases (ROG) to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, PM10, and PM2.5 are considered to be local pollutants because they tend to disperse rapidly with distance from the source. The health effects of the pollutants of concern were discussed above.

Table 3.2-3 shows the state and federal standards for a variety of pollutants.

Table 3.2-3. Ambient Air Quality Standards and Bay Area Attainment Status

Pollutant	Averaging Time	California Standards[1]		National Standards[2]	
		Concentration	Attainment Status	Concentration[3]	Attainment Status
Ozone	8 Hour	0.070 ppm (137 µg/m^3)	N[9]	0.075 ppm (147 µg/m^3)	N[4]
	1 Hour	0.09 ppm (180 µg/m^3)	N	–	See Note [5]
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m^3)	A	9 ppm (10 mg/m^3)	A[6]
	1 Hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	A
Nitrogen Dioxide	1 Hour	0.18 ppm (339 µg/m^3)	A	0.100 ppm See Note 11	U
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	A	0.053 ppm (100 µg/m^3)	A
Sulfur Dioxide	24 Hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	A
	1 Hour	0.25 ppm (655 µg/m^3)	A	–	-
	Annual Average	–	–	0.030 ppm (80 µg/m^3)	A
Particulate Matter (PM10)	Annual Arithmetic Mean	20 µg/m^3	N[7]	–	-
	24 Hour	50 µg/m^3	N	150 µg/m^3	U
Particulate Matter - Fine (PM2.5)	Annual Arithmetic Mean	12 µg/m^3	N[7]	15 µg/m^3	A
	24 Hour	–	–	35 µg/m^3 See Note 10	N
Sulfates	24 Hour	25 µg/m^3	A		
Lead	Calendar Quarter	–	–	1.5 µg/m^3	A
	30 Day Average	1.5 µg/m^3	A	–	–
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	U	–	–
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m^3)	No information	–	–
Visibility Reducing Particles	8 Hour (1000 to1800 PST)	See Note 8	U	–	–

Notes:

A = Attainment; N = Nonattainment; U = Unclassified; mg/m^3 = milligrams per cubic meter; ppm = parts per million; µg/m^3 = micrograms per cubic meter

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, 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 PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB 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.

[2] 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 3-year average of the 4th highest daily concentrations is 0.075 ppm (75ppb) or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 $\mu g/m^3$. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than35 $\mu g/m^3$.

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 PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

[3] National air quality standards are set at levels determined to be protective of public health with an adequate margin of safety. Each state must attain these standards no later than 3 years after that state's implementation plan is approved by the Environmental Protection Agency.

[4] In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. US EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e. 75 ppb) effective May 27, 2008. EPA issued final designations based upon the new 0.75 ppm ozone standard on January 16, 2009.

[5] The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

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

[7] In June 2002, ARB established new annual standards for PM2.5 and PM10.

[8] 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.

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

[10] U.S EPA lowered the 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA designated the BAAQMD as non-attainment for for the 35 $\mu g/m^3$ standard on October 8, 2009. These designations became effective on December 14, 2009.

[11] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).

Source: BAAQMD 2010b. < http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm>

Attainment Status

The CAA requires the ARB to designate areas within California as either attainment or non-attainment for each criteria pollutant based on whether the California Ambient Air Quality Standards (CAAQS) have been achieved. Under the CCAA, areas are designated as non-attainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as non-attainment. Attainment status is noted in Table 3.2-3.

Areas such as the BAAQMD are classified as either in attainment or nonattainment with respect to state and federal ambient air quality standards. These classifications are determined by comparing actual monitored air pollutant concentrations to state and federal standards. Under the California standard, the BAAQMD is a nonattainment area for both 1-hour and 8-hour O_3. The

BAAQMD is also in nonattainment for both respirable particulate matter (PM10) and fine particulate matter (PM2.5) (BAAQMD 2010). Under the federal standard, the BAAQMD is in non-attainment for 8-hour O_3. The pollutants of greatest concern in this area are O_3 and inhalable particulate matter. As seen from Table 3.2-4 below, the project area has experienced violations of the standards for state O_3 standards and particulate matter smaller than or equal to 10 microns in diameter (PM10) and 2.5 microns (PM2.5) during the last four years.

Existing Air Quality Conditions

Criteria Pollutants

Existing air quality conditions in the Proposed Project area can be characterized by monitoring data collected in the region. PM2.5 and PM10, CO, and O_3 concentrations are measured at several monitoring stations. These are the pollutants of greatest concentration within the BAAQMD and the pollutants of most concern from the Proposed Project. Air quality monitoring data for the Fremont–Chapel Way Monitoring Station (the closest monitoring station) for four preceding years are presented in Table 3.2-4.

Table 3.2-4. Ambient Air Quality Monitoring Data from Fremont Chapel Way Monitoring Station

Pollutant Standards	2006	2007	2008	2009
Ozone				
Maximum 1-hour concentration (ppm)	0.102	0.079	0.112	0.099
Maximum 8-hour concentration (ppm)	0.074	0.068	0.079	0.075
Number of Days Standard Exceeded				
CAAQS (1-hour) > 0.09 ppm	4	0	1	4
NAAQS (8-hour) > 0.075 ppm	0	0	1	0
CAAQS (8-hour) > 0.070 ppm	3	0	3	2
Particulate Matter (PM10)				
Maximum 24-hour concentration ($\mu g/m^3$)	56.6	60.6	38.7	31.4
Annual average concentration ($\mu g/m^3$)	19.9	19.6	18.7	18.3
Number of Days Standard Exceeded				
NAAQS (24-hour) > 150 $\mu g/m^3$	0	0	0	0.0[1]
CAAQS (24-hour) > 50 $\mu g/m^3$	4.3	6.0	NA	0.0[1]
CAAQS (annual) > 20 $\mu g/m^3$ exceeded?	Yes	Yes	No	No[1]
Particulate Matter (PM2.5)				
Maximum 24-hour concentration ($\mu g/m^3$)	43.9	51.2	28.6	39.3
Annual average concentration ($\mu g/m^3$)	10.3	8.7	9.5	9.3
Number of Days Standard Exceeded				
NAAQS (24-hour) > 35 $\mu g/m^3$	5.9	6.0	0.0	3.1
NAAQS (annual) > 15 $\mu g/m^3$ exceeded?	No	No	No	No
CAAQS (annual) > 12 $\mu g/m^3$ exceeded?	No	No	No	No

Pollutant Standards	2006	2007	2008	2009
Carbon Monoxide (CO)				
Maximum 8-hour concentration (ppm) Maximum 1-hour concentration (ppm)	1.81 2.9	1.57 2.5	1.43 2.4	1.20 NA
Number of Days Standard Exceeded				
NAAQS (8-hour) ≥ 9 ppm NAAQS (1-hour) ≥ 35 ppm	0 0	0 0	0 0	0 NA
CAAQS (8-hour) ≥ 9.0 ppm CAAQS (1-hour) ≥ 20 ppm	0 0	0 0	0 0	0 NA
Nitrogen Dioxide (NO_2)				
Maximum 1-hour concentration (ppm) Annual average concentration (μg/m^3)	0.063 0.015	0.058 0.014	0.062 0.014	0.051 0.013
Number of Days Standard Exceeded				
CAAQS (1-hour) ≥ 0.18 ppm	0	0	0	0

[1] Year 2009 PM10 monitoring data is from the Berkeley – 6th Street monitoring station, as the 2009 data for Fremont - Chapel Way was not available.

NA = not available from current website data, ppm = parts per million, μg/m^3 = micrograms per cubic meter, mg/m^3 = milligrams per cubic meter, > = greater than, ≥ = greater than or equal to

Source: ARB 2010. http://www.arb.ca.gov/adam/welcome.html (Top 4 Summary, all pollutants except 1-hour CO); USEPA 2010. www.epa.gov/air/data/monvals.html (Monitor Values Report – Criteria Air Pollutants, 1-hour CO)

Regional TAC Background Levels

Ambient levels of selected TACs are measured by the ARB at several locations within the San Francisco Bay Area. The closest TAC monitoring stations to Union City are in Fremont and Hayward, approximately 6 miles and 9 miles south and north of the Proposed Project site, respectively. Both of these stations may potentially contain higher, as well as different, TAC concentrations than those near the Proposed Project because of the distance from the project site and the myriad of land uses in those areas. Because DPM is not collected at the two monitoring stations, background concentrations for this TAC were obtained from the 2009 California Almanac of Emissions and Air Quality (ARB 2009). The annual average concentration for DPM in the San Francisco Bay Area Basin (SFBAB) is 1.6 micrograms per cubic meters (μg/m^3). The total estimated cancer risk associated with all TAC's in the SFBAB is 659 chances in one million: 480 chances in one million of which are attributed to DPM.

For perspective, one out of three Americans will eventually develop cancer, and one out of four will die from cancer. Therefore, the national average background cancer incidence is equivalent to 333,000 chances in one million.

Sensitive Land Uses

Sensitive land uses are generally defined as locations where people reside or where the presence of air emissions could adversely affect the use of the land. Typical sensitive receptors include (but are not limited to) residents, school children, hospital patients, and the elderly. Residential and other land uses are represented by a nearby, recently constructed residential development (KB Homes) and the community of Avalon Bay. Implementation of the Proposed Project would also locate sensitive receptors (i.e., residential land uses) at the project area.

Project Impacts and Mitigation Measures

This section describes the impact analysis relating to air quality for the Proposed Project. It describes the methods used to determine the impacts of the project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

Thresholds of Significance

For this analysis, an impact pertaining to air quality was considered significant under CEQA if it would result in any of the following environmental effects, which are based on professional practice and State CEQA Guidelines Appendix G (14 CCR 15000 et seq.).

Based on standard professional practice and State CEQA Guidelines Appendix G the Proposed Project would have a significant impact on air quality if it would:

- conflict with or obstruct implementation of the applicable air quality management plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for O_3 precursors);
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

In addition to the above significance criteria, operational emission thresholds are contained in the *BAAQMD CEQA Guidelines for Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD1999). Project operations would result in a significant impact on air quality if they would result in any of the following:

- a net increase in pollutant emissions of 80 pounds per day (ppd) or 15 tons per year (tpy) of ROG, NO_X, or PM10.
- a probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeding 10 in one million.

The 1999 BAAQMD CEQA guidelines do not contain significance threshold for PM10 from construction activities. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM10 emissions, which are listed below.

As noted above, BAAQMD adopted new CEQA guidelines in June 2010. However, as noted by BAAQMD, it is the policy of BAAQMD to not require the application of the new guidelines to projects with an NOP or start of environmental analysis prior to the effective date of the new guidelines. As noted above, this project's NOP and environmental analysis commencement were both in 2008, nearly two years before adoption of the new guidelines. As such, this project, in conformance with BAAQMD policy, utilizes the prior CEQA guidelines.

Carbon Monoxide Hotspots

The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. The following are applicable local emission concentration standards for carbon monoxide:

- California State one-hour CO standard of 20 ppm
- California State eight-hour CO standard of 9.0 ppm
- National one-hour CO standard of 35 ppm
- National eight-hour CO standard of 9 ppm

As in most urban areas, high short-term concentrations of CO, known as "hotspots," can be a problem in San Francisco Bay Area. Hotspots typically occur in areas of high motor vehicle use, such as in parking lots, at congested intersections, and along highways. Since CO build-up typically occurs at locations where traffic is congested, CO concentrations are often correlated with LOS at intersections. LOS expresses the congestion level for an intersection and is designated by a letter from A to F, with LOS A representing the best operating conditions and LOS F the worst. Significant concentrations of CO sometimes occur (depending on temperature, wind speed, and other variables) at intersections where LOS is rated at D or worse.

Significance of CO emissions from vehicles was evaluated based on the following criteria. The first criterion is based on whether the traffic associated with the Proposed Project would change the LOS of an intersection, and thereby have the potential to generate CO hotspots. If the LOS remained unaffected, it would be assumed that vehicle emissions would not contribute to CO hotspots. A significant impact would occur if: a) project-generated traffic degrades the LOS at intersections to level D or worse, and b) sensitive receptors are nearby, and c) CO hotspot modeling indicates the standards noted above would be exceeded.

Methods

The Proposed Project would generate construction-related emissions and operational emissions. The methods used to evaluate construction and operational impacts are described below.

Construction Emissions

Construction of the Proposed Project would result in the temporary generation of emissions of ROG, NO_X, PM10 and PM2.5. Emissions would originate from construction equipment exhaust, employee vehicle exhaust, dust from clearing the land, exposed soil eroded by wind, and volatile organic compounds (VOCs) from asphalt paving. Construction-related emissions would vary depending on the level of activity, length of construction, specific construction operations, equipment type, personnel, wind and precipitation conditions, and soil moisture.

BAAQMD does not require quantification of construction emissions. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM10 emissions (BAAQMD1999). Experience has shown that there are a number of feasible control measures that can be reasonably implemented to reduce PM10 emissions during construction. These control measures are aimed at controlling PM10 emissions and are summarized in Table 3.2-5. According to the BAAQMD, if all control measures indicated in Table 3.2-5 are implemented (as appropriate, depending on the size of the project area), air pollutant emissions from construction activities are considered less than significant (BAAQMD 1999).

Table 3.2-5. BAAQMD Feasible Control Measures for Construction Emissions of PM10

BAAQMD Measures
Basic Control Measures[1]
▪ Water all active construction areas at least twice daily. ▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. ▪ Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
Enhanced Control Measures[2]
▪ Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (i.e., previously graded areas inactive for ten days or more). ▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) ▪ Limit traffic speeds on unpaved roads to 15 mph. ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

BAAQMD Measures
▪ Replant vegetation in disturbed areas as quickly as possible.
Optional Control Measures[3]
▪ Install wheel washers for all exiting trucks or wash off the tires or tracks of all trucks and equipment leaving site. ▪ Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas. ▪ Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. ▪ Limit the area subject to excavation, grading and other construction activity at any one time.
[1] Should be implemented at all construction sites [2] Should be implemented at construction sites greater than four acres in area [3] Strongly encouraged at construction sites that are large in area, located near sensitive receptors or which for any other reason may warrant additional emissions reductions Source: BAAQMD 1999.

Construction equipment also emits CO and O_3 precursors. Construction-related emissions of these pollutants were not estimated, however, because they are already included in the emission inventory that forms the basis for the BAAQMD's regional air quality plans and because those emissions are not expected to impede attainment or maintenance of O_3 and CO standards in the Bay Area (BAAQMD 1999).

Area Source and Vehicular Emissions from Project Operation

The primary operational emissions associated with the project are CO, PM10 and PM2.5, and ozone precursors emitted from vehicle exhaust and area sources. The effects of emissions of PM10, PM2.5, and ozone precursors were evaluated using the URBEMIS2007 model while cumulative CO emissions were evaluated through CO dispersion modeling. Both models are briefly described below.

URBEMIS2007 Model

Traffic associated with the Proposed Project is the primary source of operation-related emissions of ROG, NO_X, CO, and PM10. Emissions of criteria pollutants associated with development of new building space and increased vehicle trips were estimated using the URBEMIS 2007 model. Criteria pollutants associated with residential, commercial, and industrial development would be emitted from 1) natural gas combustion for water and space heating, 2) personal household product use, and 3) landscape maintenance equipment. In addition, criteria pollutants would be emitted as vehicle exhaust from increased passenger car trips. Emissions of ROG, NO_X, CO, PM10, and PM2.5 were estimated using the URBEMIS2007 model.

Carbon Monoxide Impacts at Congested Intersections

The CALINE4 Model

Localized increases in CO concentrations from vehicle congestion at intersections affected by development were modeled using the California Department of Transportation (Caltrans) CALINE4 line source dispersion model (Benson 1989). CO concentrations at intersections with the highest traffic volumes and those with level of service (LOS) E or F near the vicinity of the project site were estimated using CALINE4. LOS is a measure of traffic delay, rated A-F, with F indicating the worst delay.

CO Modeling Procedures

Roadway and Traffic Conditions

Traffic volumes and operating conditions used in the modeling runs were obtained from the traffic analysis (see Appendix I, Fehr & Peers 2010). CO modeling was conducted using AM and PM peak-hour traffic volumes for the existing (2007) and cumulative year 2035.

Vehicle Emission Rates

Vehicle emission rates were determined using the ARB Board's EMFAC2007 (Version 2.3) emission rate program. The free flow vehicle traveling speed for the analyses was selected to be 1 mile per hour (mph) for links at the intersections. A slow speed of 1 mph was selected because it is the highest CO value as compared to all other speeds, as estimated by the EMFAC2007 model.

Receptor Locations

CO concentrations were estimated at four receptor locations near the intersections. Receptors were chosen based on the CO protocol developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997), and were located 3 meters from the edge of the intersection in all directions to represent a worst-case scenario. Receptor heights were set at 5.9 feet.

Meteorological Conditions

Meteorological inputs to the CALINE4 model were determined using methodology recommended in the CO protocol (Garza et al. 1997). The meteorological conditions used in the modeling represent a calm winter period. The worst-case wind angles option was used to determine a worst-case concentration for each receptor. The meteorological inputs include: 0.5 meter per second wind speed, ground-level temperature inversion (atmospheric stability class G), wind direction standard deviation equal to five degrees, and a mixing height of 1,000 meters.

Background Concentrations and 8-Hour Values

A background concentration of 2.9 ppm was added to the modeled 1-hour values to account for sources of CO not included in the modeling. Eight-hour modeled values were calculated from the 1-hour values using a persistence factor of 0.7. Background concentration of 1.81 ppm was added to the modeled 8-hour values. 1-hour background concentration data were taken from the monitoring data provided by the ARB (ARB 2010) and 8-hour background concentration data were taken from the EPA (USEPA 2010). Actual 1-hour and 8-hour background concentrations would likely be lower than those used in the CO modeling analysis because the maximum value for the previous four years was applied as background concentrations, and background levels of CO are anticipated to lower as older, more polluting vehicles are replaced with cleaner, less polluting vehicles.

Diesel Risk Characterization

A diesel risk characterization was conducted as part of the EIR Union City Intermodal Passenger Rail Project (Jones & Stokes 2006). This evaluation is applicable to the current project for evaluation of potential health risks to new residents from adjacent passenger rail service. The methodology used for this prior study is described below.

In August 1998, the ARB identified diesel exhaust as a toxic air contaminant (TAC) (ARB, 1998). In the identification report, Office of Environmental Health Hazard Assessment (OEHHA) provided an inhalation noncancer chronic reference exposure level (REL) of 5 micrograms per cubic meter (µg/m3) and a range of inhalation cancer potency factors of 1.3 x 10-4 to 2.4 x 10-3 per µg/m3.

The Scientific Review Panel on Toxic Air Contaminants recommended a "reasonable estimate" inhalation unit risk factor of 3.0 x 10-4 per µg/m3. From the unit risk factor an inhalation cancer potency factor of 1.1 per mg/kg/day may be calculated. These noncancer and cancer health factors were developed based on whole (gas and particulate matter) diesel exhaust. The surrogate for whole diesel exhaust is diesel PM. PM10 (particulate matter, ten microns or less in size) is the basis for the potential risk calculations (ARB 1998).

Cancer

When evaluating health risks from diesel exhaust exposure, the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential noncancer health impacts. Therefore, inhalation cancer risk is the primary consideration for health effects according to OEHHA and ARB guidelines. When comparing whole diesel exhaust to speciated diesel exhaust (e.g., Polycyclic Aromatic Hydrocarbon (PAHs), metals), potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated components. For this reason, an analysis of multipathway risk is not necessary.

A health risk assessment of diesel particulate matter from train engine exhaust was prepared to evaluate the increase in cancer risk from diesel trains at a location 100 feet from the track, which is the closest distance between new residences and the nearest rail track.

The EPA model CAL3QHCR was used to calculate ground-level concentrations of PM10, and the OEHHA unit risk factor 0.0003 per $\mu g/m^3$ for diesel particulate matter was used to calculate cancer risk. Impacts were modeled on the section of track where residences are closest. Five years of meteorological data for Union City were obtained from the BAAQMD and used in the dispersion modeling.

The health risk of train activities was based on a weighted average of locomotive emissions over the next 70-years, as new or remanufactured locomotives are subject to EPA tier requirements for diesel engines. As such, emission factors will gradually reduce over the next 70-years. Train emissions were based on the fleet average of locomotive emission factors for the years 2010 and 2040. The fleet average locomotive emission factor in 2010 is 4.7 grams per gallon, or 0.226 grams per brake horsepower-hour of PM10. The fleet average locomotive emission factor in 2040 is predicted to be 0.4 grams per gallon, or 0.019 grams per brake horsepower-hour of PM10 (EPA 2009). The modeling assumed that for the first 40 years of the 70-year risk assessment period, the engines would be the fleet average of 2010, and for the remaining 30 years, the engines would be the fleet average of 2040.

Impacts and Mitigation Measures

This section evaluates the potential air quality impacts of the Proposed Project. Project construction is scheduled over three phases from 2012 to 2022. Operational impacts include emissions associated with the project, including traffic. For purposes of estimating emissions and evaluating air quality impacts, it was assumed that the project would be built out by 2022.

Impact AIR-1: Conforms with Implementation of Air Quality Attainment Plan

The California CAA requires that districts that do not meet the State ozone standard prepare plans for attaining the standard and to update this plan every three years. Regional air quality plans are required to achieve a reduction in district-wide emissions of 5 percent per year for ozone precursors. If an air district is unable to achieve this 5 percent reduction, the adoption of all feasible measures on an expeditious schedule is acceptable, as an alternate strategy.

The currently applicable Air Quality Attainment Plan (AQAP) for the region is the 2005 Ozone Strategy (the Draft 2010 Clean Air Plan has not yet been adopted; it is scheduled for approval in September 2010). The 2005 Ozone Strategy recognizes growth of the population and economy within the air basin, using growth projections from the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC). Projects that propose development consistent with the growth projected by the General Plan would be consistent with the Ozone Strategy, in that the development would not result in emissions that exceed the emissions projected in the Ozone Strategy. If a project proposes development that is greater than that anticipated in the General Plan, the project would potentially be in conflict with the Ozone Strategy and would potentially have a significant impact on air quality.

Another measure of a project's consistency with the Ozone Strategy is whether the development would achieve the underlying goals and objectives of the General Plan. In this case, the Proposed Project would create more residences and less commercial square footage than what was evaluated in the 2002 General Plan Environmental Impact Report for the Intermodal Station District. However, given the proximity of the site to public transit facilities and amenities within walking distance, the Proposed Project would generate fewer emissions that contribute to existing ozone violations compared to a project that was not located adjacent to transit and commercial/retail amenities. Furthermore, the Proposed Project achieves the underlying goals and objectives of the General Plan: specifically the General Plan's vision for the Station District to locate commercial, residential, and commercial land uses around the Intermodal Station. The Proposed Project would also be consistent with the goal of the General Plan Transportation Element which is to enhance the regional accessibility of Union City through public transit and provide alternatives to single-occupant automobile trips.

Although the project is not consistent with the current Union City General Plan and thus not consistent with the growth projections in the 2005 Ozone Strategy, the project is exactly the kind of mixed use transit-oriented development that the 2005 Ozone Strategy (and the 2010 Draft Clean Air Plan) call for as one of the solutions to reducing regional ozone emissions.

Given this broader regional perspective (which is the point of the Ozone Strategy), for the purposes of this analysis, the Proposed Project is considered consistent with the spirit of the applicable AQAP and the technical differences between the emissions forecasts of the AQAP and the Station District Mixed-Use Development Project are considered less than significant. Were the project not built as proposed, the end result would be regionally less dense, less transit-oriented development, which would not be consistent with current air quality planning.

The Proposed Project is thus considered consistent with the spirit of AQAP, would not obstruct implementation of the AQAP, and impacts related to the inconsistency of emissions forecasts between the AQAP and the 2002 General Plan are considered to be less than significant.

Construction Impacts

Impact AIR-2: Generation of PM10 and Construction Vehicle Exhaust Emissions

During construction of the Proposed Project, emissions would be produced by a variety of sources. They would include criteria pollutant emissions produced by construction equipment and fugitive dust created by wind and the operation of construction equipment over exposed earth. The BAAQMD's CEQA Guidelines do not require that emissions be estimated for construction activities. Instead, specific construction-related mitigation measures must be implemented to minimize dust generation. Consequently, construction-related emissions were not estimated for the Proposed Project.

Because construction activities could result in a significant increase in PM10 and construction vehicle exhaust emissions, this impact is considered significant.

Mitigation Measure AIR-2: Implement Dust and Vehicle Emission Control Measures

The construction contractor will implement feasible control measures presented in Table 3.2-5 to control dust emissions during construction. Implementation of these measures would reduce impacts from PM10 and construction vehicle exhaust emissions to a less-than-significant level.

Operational Impacts

The main operational impacts associated with the Proposed Project would result from project-related traffic. Minor impacts would be associated with area sources, such as space heating and landscaping.

Impact AIR-3: Increase in Ozone Precursor (ROG and NO_X) and PM2.5 emissions during Project Operation

To address whether the Proposed Project would result in emissions that would violate any air quality standard or contribute substantially to an existing or proposed air quality violation, the emissions associated with the project traffic were compared with the BAAQMD significance criteria. According to the traffic engineer, the project-generated daily traffic is estimated to be 5,700 total trips by the completion of the project (Personal Communication with Seth Andrzejewski 2010). The traffic analysis estimated that approximately 342 AM peak hour and 570 PM peak hour trips would be generated from the project (Fehr and Peers 2010).

To estimate emissions associated with project operations, the URBEMIS2007 (version 9.2.4) model was used. Operational emissions were modeled for full buildout year 2022 assuming that the project will be completed by then. Emissions associated with landscaping and energy use were included in the area source emission estimates. Note that URBEMIS does not include an option for estimating emissions for the year 2022. Thus, the year 2020 was used for this analysis.

The Proposed Project inherently includes various design features that reduce motor vehicle trips. Based on information provided by the traffic engineers (Fehr and Peers 2010), trip generation rates for the Proposed Project’s land uses were calculated based on the design of the Project. The trip generation rates applied within the URBEMIS model reflect the likelihood that the high-density and transit-oriented nature of the Proposed Project reduces overall motor vehicle trips. In addition, the following measures were applied to the unmitigated Project scenario in URBEMIS to reflect the favorable location relative to transit and alternate transportation opportunities:

- 500 housing units within a ½ mile radius of the project (not including the Project's residential units);
- The presence of local-serving retail;
- 100 percent of sidewalks within ½ mile of the project site with sidewalks on both sides; and
- 50 percent of arterials/collectors with bike lanes.

The maximum daily unmitigated operational emissions anticipated from the Proposed Project are presented in Table 3.2-6 below. The URBEMIS2007 model outputs are presented in Appendix F of this EIR.

Table 3.2-6. 2022 Unmitigated Build-Out Operational Emissions

	Maximum Daily Emissions (pounds per day)				
	ROG	**NO_X**	**CO**	**PM10**	**PM2.5**
Area Source Emissions	45	18	10	<1	<1
Vehicular Emissions	19	22	170	48	9
Total Emissions	65	40	178	49	10
Significance Criteria	80	80	550	80	80
Significant?	No	No	No	No	No

Area source, vehicular, and total emissions shown are the maximum of summer and winter emissions. Therefore, totals may not add up.

Source: URBEMIS modeling, ICF 2010.

As indicated in Table 3.2-6, operational emissions are below the applicable BAAQMD thresholds of significance for each criteria pollutant. Therefore, impacts related to the Proposed Project are considered less than significant. No mitigation is required.

Impact AIR-4: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations of CO

Project-generated vehicle trips would increase traffic volumes at roadway intersections in the Proposed Project vicinity once the project becomes operational following completion of the first phase of project construction. During periods of near-calm winds, heavily congested intersections can produce elevated levels of CO that could potentially impact nearby sensitive receptors. Therefore, a CO hot spot analysis was conducted to determine whether the Proposed Project would contribute to a violation of the ambient air quality standards for CO at any local intersections.

The Transportation Project-Level Carbon Monoxide Protocol (Garza et al. 1997) was followed to determine whether a CO hot spot is likely to form due to project-generated traffic. In accordance with the Protocol, CO hot spots are typically evaluated when (a) the LOS of an intersection decreases to a LOS D or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection. In general, CO hot spots would be anticipated near affected intersections because operation of vehicles in the vicinity of congested intersections involves vehicle stopping and idling for extended periods.

As described in the traffic report (Appendix I), implementation of the Proposed Project would result in certain intersections operating at LOS D or worse in the existing plus project conditions, existing plus project plus intermodal development condition and/or the cumulative conditions. As a result and as described below, an analysis of cumulative traffic of local intersections was conducted. The cumulative traffic conditions are the worst of the studied conditions, and thus use of those conditions is a worst-case analysis. As indicated below in Table 3.2-7, for the cumulative conditions, CO levels would be less than applicable state and federal standards.

Therefore, this impact is considered to be less than significant.

Impact AIR-5: Expose Sensitive Receptors to Substantial Pollutant Concentrations

ARB's Air Quality and Land Use Handbook: A Community Health Perspective (ARB 2005) provides ARB recommendations for the siting of new sensitive land uses (including residences) near major sources of emissions, including freeways, rail yards, ports, refineries, and gasoline dispensing facilities.

The relevant sources of TAC emissions to the project include existing and proposed rail operations and bus use at the Intermodal Station.

The Proposed Project would locate residents approximately 100 feet south of an existing railway (the Niles Subdivision), 350 feet north of another existing railway (the Oakland Subdivision), and 550 feet north of the bus depot at the Intermodal Station south of the project site.

The Niles Subdivision rail line is currently used by the Capitol Corridor passenger service with approximately 4 round trip trains (8 train trips per day). This Subdivision does not currently connect to rail lines heading east through Niles Canyon which limits its freight use between the Port of Oakland and the Central Valley. Freight use in 2005 was approximately 12 trains per week between Oakland and Niles Junction (HNTB 2006) likely primarily between the Port of Oakland and the NUMMI Plant. With closure of the NUMMI plant, there is limited freight use of this subdivision although it is available for use to connect from Oakland to Fremont and Milpitas.

The Oakland Subdivision is not used for passenger service nor through freight service at present, although it is used for limited local freight movement (Earthtec/Korve 2007). It is proposed that Capitol Corridor move its passenger rail to the Oakland Subdivision and that the proposed Dumbarton Rail project also use this rail line. Thus, in the future there could be passenger rail service to the south of the Proposed Project instead of the present Capitol Corridor rail service to the north.

At the current Intermodal Station, BART provides electric-powered train service which is not an emissions concern. Multiple bus agencies service the Intermodal Station, including AC Transit, Union City Transit, and the Dumbarton Express. City buses that service the Intermodal Station are a mix of diesel and natural gas (CNG) powered. However, in the future a number of diesel-powered buses will be replaced by CNG-powered buses. Since 2000, the City has been committed to purchasing new vehicles that run on CNG. About eight years ago, the City adopted the "Alternative Fuel Path" for its bus fleet, committing to the ARB that all future bus replacements and expansions will be with alternative fueled vehicles. So far, four diesel buses have been replaced with CNG buses, two additional CNG replacement buses are on order and six additional buses are anticipated to be ordered within the next few years.[1] Given the distance (>~550 feet) from the proposed project location, bus emissions effects were not modeled for this project.

Given the minimal/infrequent freight service at present along the rail lines near the proposed project, the analysis of potential health risks focused on passenger rail service. There is a separate proposal to shift freight lines from the UP Coast Subdivision (west of I-880 in Union City) to the Niles Subdivision that is not part of the proposed project; that potential is discussed in the cumulative analysis below.

The health effects of residences adjacent to the Capitol Corridor passenger rail and the potential future Dumbarton Rail Corridor (DRC) service was evaluated for the EIR for the Union City Intermodal Passenger Rail Project (Jones & Stokes 2006). Based on input from Capitol Corridor and the DRC, that analysis included the following assumptions:

- 32 Capitol Corridor trains (16 roundtrips) operating daily (note that at present 8 trains/4 roundtrips occur for this service)
- 12 DRC train trips (6 roundtrips) daily. Due to limitations in the model used for the analysis, the model included DRC traffic on weekends; however, DRC is a commuter rail and would likely not operate on weekends.
- 12 trips to and from the layover yard daily for DRC, leaving between 5:30 and 9:00 a.m. and returning between 6:00 and 10:00 p.m.)
- Existing Capitol Corridor trains currently meet EPA Tier 2 standards for diesel locomotives and would meet EPA Tier 3 standards prior to proposed project occupancy.
- All new locomotives for Capitol Corridor and DRC would meet EPA Tier 3 standards.
- The distance to receptor is 50 feet from the rail line.

[1] Based on correspondence with Carmela Campbell of the City, June, 2008.

The health risk assessment used the assumptions noted above and the methodology described earlier in this section. The significance threshold of 10 in 1 million is based on the Bay Area Air Quality Management District's Risk Management Policy. A project is considered acceptable by the BAAQMD if the annual emissions associated with the project would result in an incremental cancer risk equal to or less than ten in a million, were the exposure to continue for 70 years (BAAQMD 1999).

The results of the analysis show that the project would result in an increased health risk of 5 in one million, which is less than the BAAQMD's significance threshold of 10 in one million. The risk calculation is based on air quality modeling that includes five year's worth of hourly wind speed and direction data for the general project vicinity. It should be noted that the closest new residences in the proposed project would come to the rail line would be 100 feet (Niles Subdivision) and would be much greater (350 feet) if the Capitol Corridor and DRC are ultimately located on the Oakland subdivision.

Based on the distance to sources of diesel TAC emissions and the level of expected activity, diesel TAC emissions are not expected to exceed the relevant BAAQMD risk threshold. Therefore, this impact is considered to be less than significant.

Impact AIR-6 Expose Sensitive Receptors to Objectionable Odors

The BAAQMD established a Project Screening Distance for siting new sensitive receptors near potential odor sources. The Proposed Project is within the project 1-mile screening distance for receptors near a transit station. Therefore, there is a potential for new residents of the proposed mixed-use development to be exposed to objectionable odors associated with the Intermodal Station due to diesel emissions associated with the day to day bus operations (BART trains are electric and thus not an odor issue; passenger and freight rail service is far less frequent than BART and bus operations and thus of lesser odor concern). The City is currently in the process of replacing diesel powered buses with CNG buses which will reduce diesel odors. Therefore, impacts related to exposure of sensitive receptors to objectional odors are considered less than significant.

Cumulative Impacts

The State CEQA Guidelines require that projects be evaluated with respect to their contribution to the cumulative baseline conditions. This contribution with respect to air emissions would include both construction and operational emissions.

Cumulative impacts include impacts from closely related past, present, and reasonably foreseeable probable future projects which could, in combination with the impacts from the Proposed Project, result in cumulatively considerable impacts. Past, present, and probable projects have been identified in Chapter 4, Table 4-1 that may result in cumulative impacts within the project vicinity.

Criteria Pollutants

Cumulative impacts to air quality could occur as a result of air pollutant emissions from mobile, area, and stationary sources attributed to buildout of the Proposed Project in combination with other cumulative projects. However, cumulative thresholds for a project's cumulative contribution are the same as those used when considering a project-specific air quality impact because the thresholds are related to a project's contribution to the regional air quality baseline. If a project would result in exceedance of daily emission limits, then it can be considered to contribute to cumulatively considerable air quality impacts.

The Proposed Project is a mixed-use residential and commercial project that would not violate relevant air quality standards, as determined by the BAAQMD CEQA Guidelines (BAAQMD 1999). According to the Guidelines, "any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be based on an evaluation of the consistency of the project with the local general plan *and* of the general plan with the regional air quality plan." If the above holds true, then the Proposed Project will have not have a significant cumulative impact.

That document contains screening criteria for residential and commercial facilities such as are proposed in the project. According to the *Guidelines*, the criteria "may provide a simple indication of whether a project may exceed the threshold," but "should be used only for project screening, and should not be considered absolute thresholds of project significance." (BAAQMD, 1999) The threshold for potentially-significant emissions is 510 apartment units. The 973-unit development proposed exceeds the project-screening significance threshold.

As shown in Table 3.2-6, unmitigated emissions calculated for project operations are less than the applicable BAAQMD daily significance thresholds, which are designed to assist the region in attaining the applicable State and national ambient air quality standards. These standards apply to both primary (criteria and precursor) and secondary pollutants (ozone). The project is within the Station District, a mixed-use residential, commercial, and retail land use area designed around an intermodal transit station. Given its mixed-use nature and its proximity to the transit station, emissions from project operations will be below the level of significance, even though the development exceeds the screening criteria for number of apartment units. Implementation of the project will concentrate residents, jobs, shopping, and mass transit options in one area, thereby reducing motor vehicle trips and subsequent air quality impacts of the project. Therefore, the Proposed Project is consistent with the AQAP, which is intended to bring the Basin into attainment for all criteria pollutants.

In combination with the Proposed Project, the projects listed in Table 4-1 have the potential to exceed the threshold of significance established by the BAAQMD. However, since operational criteria pollutant emissions from the Proposed Project are not expected to exceed the threshold of significance, the project will not contribute considerably to a significant cumulative criteria pollutant emissions impact.

Cumulative CO Concentrations

The Transportation Impact Analysis (Fehr & Peers 2010) identified multiple intersections that would operate at LOS E or F during the AM and/or PM peak hours under the 2035 cumulative scenario. Given the increase in traffic associated with Proposed Project, intersections for analysis within the vicinity of the project area were sorted and screened based on both LOS and traffic volumes, and include the following:

- Decoto Road and 7th Street
- Decoto Road and 11th Street
- Mission Boulevard and Appian Way
- Alvarado-Niles Boulevard and East – West Connector
- Alvarado-Niles Boulevard and Linda Drive
- Paseo Padre Parkway and Decoto Road

The analysis was conducted using the CALINE4 line source dispersion model. Input parameters required for the CALINE4 model include traffic volumes, CO emission factors, receptor locations, meteorological conditions, and background concentrations. Both AM and PM peak traffic volumes that include the existing, 2035 baseline (e.g. future no project), and 2035 cumulative with project-generated traffic were modeled. The EMFAC2007 emission rate program was used to estimate CO emission factors in year 2035. EMFAC2007 model outputs are presented in Appendix F.

Meteorological inputs to the CALINE4 model were determined using methodology recommended in the CO Protocol (Garza et al. 1997). The meteorological conditions used in the modeling represent a calm winter period. The worst-case wind angles option was used to determine a worst-case concentration for each receptor. Results are presented in Table 3.2-7.

The Proposed Project's CO concentrations for AM and PM 1- and 8-hour CO levels for cumulative 2035 both with project and without the project are presented in Table 3.2-7. The EMFAC2007 and CALINE4 output files are in Appendix F. Therefore, based on the information shown, the Proposed Project would not have a significant impact upon 1-hour or 8-hour local CO concentrations due to mobile source emissions.

Table 3.2-7. Modeled Carbon Monoxide Levels at Receptors in the Vicinity of Affected Intersections for Cumulative 2035 Conditions (parts per million)

Intersection	Peak Period[a]	Existing (2007)		No Project (2035)		With Project (2035)	
		1-hour[b]	8-hour[b]	1-hour[b]	8-hour[b]	1-hour[b]	8-hour[b]
7th and Decoto	AM	6.2	4.12	3.7	2.37	3.7	2.37
	PM	7.1	4.75	3.5	2.23	3.8	2.44
11th and Decoto	AM	7.1	4.75	3.8	2.44	3.8	2.44
	PM	7.9	5.31	3.9	2.51	3.9	2.51
Alvarado-Niles and East-West Connector	AM	N/A	N/A	4.3	2.79	4.3	2.79
	PM	N/A	N/A	4.3	2.79	4.3	2.79
Mission and Appian	AM	8.0	5.38	4.3	2.79	4.3	2.79
	PM	8.1	5.45	4.2	2.72	4.2	2.72
Alvarado-Niles and Linda Drive	AM	5.8	3.84	3.5	2.23	3.6	2.3
	PM	6.2	4.12	3.5	2.23	3.5	2.23
Paseo Padre and Decoto	AM	N/A	N/A	4.3	2.79	4.3	2.79
	PM	N/A	N/A	4.3	2.79	4.3	2.79
Significant Impact?[c]		*No*	*No*	*No*	*No*	*No*	*No*

Notes:

N/A = Intersection does not currently exist.

[a] Peak hour traffic volumes are based on the Traffic Impact Analysis prepared for the project by Fehr & Peers 2010.

[b] Highest 4 yrs ambient background concentrations were 2.9 ppm (2006) for 1-hour and 1.96 ppm (2006) for 8-hour (2006).

[c] The State standards are 20 parts per million (ppm) for the 1-hour concentration and 9.0 ppm for the 8-hour average concentration. The Federal standards are 35 ppm for the 1-hour concentration and 9 ppm for the 8-hour concentration.

CALINE4 dispersion model output sheets and Emfac2007 emission factors are provided in Appendix F.

Based on these results, project-related CO concentrations would be less than significant near intersections with the highest traffic volumes. Therefore, the cumulatively considerable air quality impacts would be less than significant.

No mitigation is required.

Cumulative TAC Emissions

The following cumulative projects are relevant to the cumulative analysis of TAC emissions.

- The Dumbarton Rail Corridor Project, including approximately 12 trains per day arriving at the Intermodal Station and 12 trips to a layover yard (Jones & Stokes 2006).
- The Union City Intermodal Station Passenger Rail project, which would relocate the Capitol Corridor service from the Niles Subdivision to the Oakland Subdivision (Jones & Stokes 2006).

- Potential future expansion of Capitol Corridor service from 8 trains per day to 32 trains per day (see Jones & Stokes 2006).
- A proposal in the Regional Rail Plan. Construction of a new connection between the Niles Subdivision and Niles Junction allowing use of the Niles Subdivision to connect from Oakland to the Central Valley, resulting in relocation of freight traffic from the Coast Subdivision to the Niles Subdivision (Earthtech et al. 2007).

The project itself will not create substantial operational TAC emissions, so the concern about cumulative impacts is the cumulative impacts on new residents at the proposed project. As described above, the future Capitol Corridor and DRC passenger service near the project was assessed and found to result in a cancer risk level of 5 in a million for receptors within 50 feet, while this rail traffic is likely to be located more than 300 feet away when passenger rail is consolidated on the Oakland Subdivision.

The potential effects of relocating freight rail from the Coast Subdivision to the Niles Subdivision were quantitatively assessed using the CALINE model. In order to facilitate the increase of freight rail, a new connection of the Niles Subdivision to the eastward heading Oakland subdivision at Niles Junction would need to be made. At present, the Coast Subdivision between Oakland and Newark has freight traffic estimated as 4 to 6 freight trains per day (Earthec/Korve 2006). Analyzing this amount of rail traffic located approximately 100 feet from the nearest residence, the additional cancer risk is estimated as less than 2 in a million. Thus, the combined risk due to passenger rail and freight rail diesel emissions (less than 7 in a million cancer risk) at this location would be less than the 10 in a million threshold As noted above, the analysis of passenger rail impacts is overly conservative and thus the risk level would likely be lower than this.

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