4.2 AIR QUALITY

This section evaluates potential effects of the project on air quality during both construction and long-term operations. The analysis is consistent with methodologies set forth in the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines. The following analysis is based on the Air Quality and Greenhouse Gas Emissions Assessment completed in June 2014 (Illingworth & Rodkin, 2014), included as **Appendix D.**

4.2.1 EXISTING CONDITIONS

Physical Setting

The project site is located within the San Francisco Bay Area Air Basin and within the jurisdictional boundaries of the Bay Area Air Quality Management District (BAAQMD). The city of Sunnyvale is located in the northern portion of the northwest-southeast oriented Santa Clara Valley sub-region and is bounded by the Santa Cruz Mountains to the west, the Diablo Range to the east, the San Francisco Bay to the north and the convergence of the Gabilan Mountain Range and the Diablo Mountain Range to the south.

Temperatures are warm in summer, under mostly clear skies, although a relatively large diurnal range results in cool nights. Winter temperatures are mild, except for very cool but generally frostless mornings. The San Jose Airport mean maximum temperatures range from the high 70s (°F) to low 80s (°F) during the summer; high 50s (°F) to low 60s (°F) during the winter. The San Jose Airport mean minimum temperatures range from the high 50s (°F) during the summer to the low 40s (°F) during the winter. Sunnyvale's annual average rainfall is approximately 15 inches per year. The geographic terrain influences the wind patterns within the Santa Clara Valley, resulting in a prevailing flow roughly parallel to the Santa Clara Valley's northwest-southeast axis. Additionally, a north-northwesterly sea breeze extends up the valley in the afternoon/early evening and a light south-southeasterly drainage flow occurs during the late evening/early morning.

The Santa Clara Valley air pollution potential is high, owing to dense population and many mobile emission sources. As a result, the Santa Clara Valley is a major source of carbon monoxide, particulate matter, and photochemical air pollution. However,

photochemical precursors, from the neighboring San Francisco, San Mateo, and Alameda counties can also be carried along by the prevailing winds to the Santa Clara Valley, making it a major ozone receptor.

Criteria Air Pollutants and Effects

The air quality analysis generally focuses on five pollutants that are commonly measured and regulated.

- Carbon monoxide (CO)
- Ozone (O_3)
- Nitrogen Dioxide (NO_2)
- Sulfur dioxide (SO_2)
- Suspended particulate matter (PM), including PM_{10} and $PM_{2.5}$

Table 4.2-1 provides details regarding the characteristics, health effects, and sources of these pollutants.

Table 4.2-1 Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Source
Carbon Monoxide (CO)	Non-reactive, colorless and odorless gas that dissipates relatively quickly; ambient CO concentrations generally located near vehicular traffic. Highest CO concentrations measured in the Bay Area are recorded during the winter.	▪ Impairment of oxygen transport in the bloodstream ▪ Aggravation of cardiovascular disease ▪ Fatigue, headache, confusion, dizziness ▪ Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Ozone (O_3)	Colorless toxic gas and the chief component of urban smog. Present in relatively high concentrations within portions of the Bay Area; highest concentrations occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies.	▪ Eye Irritation ▪ Respiratory function impairment	Although not directly emitted from a particular source, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO_X) under sunlight; ROG and NO_X are primarily emitted from automobiles, and industrial sources.

Pollutant	Characteristics	Health Effects	Major Source
Nitrogen Dioxide (NO_2)	Reddish-brown gas that irritates the lungs; 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 PM_{10}. Levels of NO_2 in the Bay Area are relatively low.	▪ Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide (SO_2)	Primarily SO_2, sulfur oxides are colorless gases with a pungent, irritating odor Due to the lack of sources, levels of SO_2 in the Bay Area are relatively low	▪ Aggravation of chronic obstructive lung disease ▪ Increased risk of acute and chronic respiratory disease	Diesel vehicle exhaust, oil- and coal-burning power plants, industrial processes.
Particulate Matter ($PM_{2.5}$ / PM_{10})	Very small liquid and solid particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals; can produce haze and reduce regional visibility. PM_{10}: Particulate matter less than 10 microns in diameter, about one-seventh the thickness of a human hair. $PM_{2.5}$: Particulate matter 2.5 microns or less in diameter.	▪ Aggravation of chronic disease and heart/lung disease symptoms	Combustion, factories, construction, grading, demolition agricultural activities, woodstoves and fireplaces, and automobiles.

Source: BAAQMD, 2010.

Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. 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. The health effects of TACs can result from either acute or chronic exposure; many types of cancer are associated with chronic TAC exposures.

Significant environmental sources of TACs include industrial processes (e.g., petroleum refining, electronic component and chemical manufacture, and chrome plating), commercial operations (e.g., auto body shops, gasoline stations and dry cleaners) and transportation activities (particularly from diesel-powered vehicles, including trains, buses, and trucks).

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). Diesel exhaust is a complex mixture of gases, vapors and fine particles, which

complicates the evaluation of its health effects. The California Air Resources Board (CARB) previously identified some of the chemicals in diesel exhaust (including benzene and formaldehyde) as TACs; they are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants program. To reduce diesel particulates, California has adopted a comprehensive diesel risk-reduction program to reduce diesel particulate matter emissions by 85 percent by 2020. In 2006, the U.S. EPA also enacted low-sulfur diesel fuel standards for delivery and transport trucks that are expected to reduce diesel particulate matter substantially.

Sensitive Receptors

Sensitive receptors include people and locations where individuals are particularly susceptible to adverse effects of air pollution. According to CARB, sensitive receptors include children under 14, people over 65, athletes, and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. Both the state and national ambient air quality standards were developed with the intent to protect sensitive receptors from the adverse impacts of air pollution.

Figure 4.2-1 depicts sensitive receptors within close proximity to the project site. The closest sensitive receptors to the project site are existing residences located north of the Fair Oaks Avenue Overhead Bridge (bridge), adjacent to Kifer Road and east of Fair Oaks Avenue. Additionally, the sensitive receptors are located in the Heritage Park apartment community, south of the Caltrain tracks and on both sides of the bridge.

Odors

Offensive odors can be unpleasant, leading to considerable distress among the public, and often generate citizen complaints to local governments and BAAQMD. Offensive odors are typically associated with wastewater treatment plants, sanitary landfills, feedlots and dairies, and industrial facilities. The occurrence and severity of odor problems depends on numerous factors, including the nature, frequency, and intensity of the sources; wind speed and direction; and the sensitivity of the receptor(s).

4.2.2 REGULATORY SETTING

Federal Clean Air Act

The U.S. Environmental Protection Agency (EPA) regulates air quality at the federal level under the Clean Air Act (CAA) of 1970 and the related General Conformity Rule.[1] The EPA set National Ambient Air Quality Standards (NAAQS) for all air pollutants identified as being of nationwide concern, established emission standards for certain mobile sources (airplanes and locomotives), and designed procedures to oversee state air programs.

The CAA requires that states submit a State Implementation Plan (SIP) for all areas designated as *nonattainment* by federal air quality standards. *Nonattainment* is defined as any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the NAAQS for the pollutant. The SIP, which is reviewed and approved by the EPA, must identify a plan for achieving the federal standards. Failure to follow this procedure could lead to denial of federal funding and permits. In cases where a SIP is submitted by the state but a nonattainment area remains below federal standards, the EPA is directed to prepare a federal implementation plan.

The SIP guides project review and development, per the 1990 CAA amendments: "No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program or project has been found to conform to any applicable SIP in effect under this act."[2]

California Clean Air Act

The California Clean Air Act (California CAA) requires all air districts in the state to achieve and maintain California Ambient Air Quality Standards (CAAQS). CARB, part of the California Environmental Protection Agency (CalEPA), oversees state efforts to pertinent requirements of the federal CAA, administers the California CAA, and maintains the CAAQS.

[1] Title 40, Code of Federal Regulations [CFR], Parts 51 and 93

[2] Clean Air Act Section 176(c)

Additionally, CARB regulates mobile air pollution sources, such as motor vehicles, and is responsible for setting emission standards for vehicles sold in California for other emission sources, such as consumer products, and for certain off-road equipment. CARB has established passenger vehicle fuel specifications and oversees the functions of local air quality attainment plans at the regional level.

National and California Ambient Air Quality Standards

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

As required by the federal CAA, NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter, including respirable particulate matter (PM10) and fine particulate matter (PM2.5), sulfur oxides, and lead. Pursuant to the California Clean Air Act, California has established the CAAQS. Relevant state and federal standards are summarized in **Table 4.2-2**. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare. CAAQS are generally the same or more stringent than NAAQS.

Attainment Status

Areas with air quality that exceed adopted air quality standards are designated as "nonattainment" areas for the relevant air pollutants. Nonattainment areas are sometimes further classified by degree (marginal, moderate, serious, severe, and extreme for ozone, and moderate and serious for carbon monoxide and PM_{10}) or status ("nonattainment-transitional"). Areas that comply with air quality standards are designated as "attainment" areas for the relevant air pollutants. "Unclassified" areas are those with insufficient air quality monitoring data to support a designation of attainment or nonattainment, but are generally presumed to comply with the ambient air quality standard. SIPs, as described above, must be prepared by a state for areas designated as federal nonattainment areas. The SIP demonstrates how the area will come into attainment of the exceeded federal ambient air quality standard.

As a whole, the Bay Area is considered by U.S. EPA as nonattainment for the 8-hour ozone and 24-hour $PM_{2.5}$ NAAQS. The area is nonattainment or unclassified for all other pollutants under the NAAQS, including carbon monoxide and PM_{10}. At the state level, the region is designated as nonattainment for ozone, PM_{10} and $PM_{2.5}$. The region is attainment for all other pollutants regulated under the CAAQS.

Table 4.2-2 California and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment [f]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (57 mg/m^3)	Attainment	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.18 ppm (338 µg/m^3)	Attainment	0.100 ppm [j]	Unclassified
Ozone (O_3)	8-Hour	0.07 ppm (137 µg/m^3)	Nonattainment [h]	0.075 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable [e]
Suspended Particulate Matter (PM_{10})	Annual Mean	20 µg/m^3	Nonattainment [g]	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Suspended Particulate Matter ($PM_{2.5}$)	Annual Mean	12 µg/m^3	Nonattainment [g]	12 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3 See footnote [i]	Nonattainment
Sulfur Dioxide (SO_2) [k]	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment

Source: BAAQMD, 2014; EPA, 2014

[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.

[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 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} 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 $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 $\mu g/m^3$.

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 $PM_{2.5}$ standard is met if the 3-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 EPA at levels determined to be protective of public health with an adequate margin of safety.

[D] On September 22, 2011, the EPA announced it will implement the current 8-hour ozone standard of 75 ppb. The EPA expects to finalize initial area designations for the 2008 8-hour ozone standard by mid-2012.

[E] The national 1-hour ozone standard was revoked by EPA 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}. 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.

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

[I] EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA designated the Bay Area as nonattainment of the $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation is December 14, 2009, and the Air District has three years to develop a SIP that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. The SIP for the new $PM_{2.5}$ standard must be submitted to the EPA by December 14, 2012.

[J] 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).

[K] On June 2, 2010, the EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-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 EPA initial designations of the new 1-hour SO^2 NAAQS. EPA expects to designate areas by June 2012.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million

mg/m^3 = milligrams per cubic meter

$\mu g/m^3$ = micrograms per cubic meter

Source: Bay Area Air Quality Management District, 2014, EPA, 2014.

Bay Area Air Quality Management District CEQA Thresholds

The Bay Area Air Quality Management District (BAAQMD) is primarily responsible for assuring that the national and state ambient air quality standards are attained and maintained in the Bay Area. BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, and conducting public education.

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011).

In subsequent litigation, the BAAQMD CEQA Guidelines were determined to be a project under CEQA; BAAQMD was duly ordered to rescind these Guidelines pending completion of environmental review per CEQA. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of the petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The preparers of the air quality report have reviewed the evidence used to formulate the BAAQMD CEQA Guidelines, including BAAQMD's May 2010 staff report recommending the adoption of the thresholds and its attachments. The preparers concluded that substantial evidence supports the use of BAAQMD's 2010 thresholds of significance as thresholds of significance for air quality. The significance thresholds identified by BAAQMD and used in this analysis are summarized in **Table 4.2-3**.

Table 4.2-3 Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
Reactive Organic Gases (ROG)	54	54	10
Nitrogen Oxides (NO_x)	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10
Carbon Monoxide (CO)	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Best Management Practices	Not Applicable	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	10 per one million	10 per one million	
Hazard Index	1.0	1.0	
Incremental Annual Average $PM_{2.5}$	0.3 µg/m^3	0.3 µg/m^3	
Health Risk and Hazards for Sensitive Receptors (Cumulative from all sources within 1,000-foot zone of influence) and Cumulative Threshold for New Sources			
Excess Cancer Risk	100 per one million		
Chronic Hazard Index	10.0		
Annual Average $PM_{2.5}$	0.8 µg/m^3		

Source: Illingworth & Rodkin, 2014

Notes: ROG = reactive organic gases, NO_x = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

Bay Area Air Quality Management District Clean Air Plan

To achieve the CAAQS, the BAAQMD develops air quality plans addressing the California CAA and updates them every several years. On September 15, 2010, the BAAQMD adopted the 2010 Clean Air Plan (CAP). The 2010 CAP became effective immediately and includes 55 measures for reducing pollution. In general, the 2010 CAP furthers the goals of the Bay Area 2005 Ozone Strategy, and includes the following actions:

- Update the current Bay Area 2005 Ozone Strategy in accordance with the requirements of the California CAA to implement "all feasible measures" to reduce ozone;
- Provide a control strategy to reduce ozone, particulate matter, TACs, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented between the 2010 to 2012 timeframe.

BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions (e.g., Spare the Night Program). BAAQMD Regulation 6, Rule 3 restricts operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove, masonry heater, or fireplace insert on specific days during the winter when air quality conditions are forecasted to exceed the NAAQS for $PM_{2.5}$. Rule 3 also limits excess visible emissions from wood burning devices and requires clean burning technology for wood burning devices sold (or resold) or installed in the Bay Area.

In addition, BAAQMD enforces regulations regarding offensive odors. BAAQMD Regulation 7 places general limitations on odorous substances, and specific emission limitations on certain odorous compounds. The regulation applies when and if the BAAQMD receives validated odor complaints from 10 or more complainants in a 90-day period.

Sunnyvale General Plan

The Sunnyvale General Plan includes goals and policies that strive to reduce Sunnyvale residents' exposure to air pollutants.

Policy EM-11.1 The City should actively participate in regional air quality planning.

Policy EM-11.3 Require all new development to utilize site planning to protect citizens from unnecessary exposure to air pollutants.

Policy EM-11.4 Apply the indirect source rule to new development with significant air quality impacts. Indirect source review would cover commercial and residential projects as well as other land uses that produce or attract motor vehicle traffic.

Policy EM-11.5 Reduce automobile emissions through traffic and transportation improvements.

Policy EM-11.6 Contribute to a reduction in vehicle miles traveled.

Project Consistency

The proposed project would rehabilitate the existing bridge. The project would not introduce new land uses, substantially alter roadway travel lanes or speeds, nor intensify vehicle usage above existing levels. The potential for increased air quality emissions would be limited to temporary construction-related activities, as described below. The project would help ensure the long-term ongoing use of the bridge and thereby reduce the potential need for more circuitous detours that could increase vehicle miles traveled. As a result, the proposed project would not conflict with Sunnyvale General Plan policies.

4.2.3 IMPACTS AND MITIGATION MEASURES

Significance Criteria

Appendix G of the CEQA Guidelines identifies environmental issues to be considered when determining whether a project could have significant effects on the environment. The project would have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Expose sensitive receptors to substantial pollutant concentrations;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors); or
- Create objectionable odors affecting a substantial number of people.

Discussion of No Impacts

Would the project conflict with or obstruct implementation of the applicable air quality plan?

BAAQMD adopted the *Bay Area 2010 Clean Air Plan* in September 2010. The proposed project emissions would be well below BAAQMD thresholds, as shown in **Table 4.2-3.** Additionally, the proposed project has been planned as a transportation improvement project in Sunnyvale's Capital Improvement Plan. Furthermore, the project would not increase traffic capacity and, as a bridge rehabilitation project, is exempt from air quality SIP project-level conformity requirements per 40 CFR 93.126. As a result, the proposed project would not conflict with the most recent Clean Air Plan and no mitigation is required.

Discussion of Less-than-Significant Impacts

Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The Bay Area is considered a non-attainment area for ground-level ozone and fine particulate matter ($PM_{2.5}$) under both the federal CAA and the California CAA. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}) under the California CAA, but not the federal CAA. The area has attained both California and federal ambient air quality standards for carbon monoxide.

The project would have construction emissions that would be below significance thresholds adopted by BAAQMD for evaluating impacts to ozone and particulate matter, as shown in **Table 4.2-4**. Therefore, the project would not contribute substantially to existing or projected violations of those standards.

Table 4.2-4 Construction Period Emissions

Scenario	ROG	NOx	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
2015 Annual Emissions (tons per year)	0.16	1.27	0.08	0.08
2016 Annual Emissions (tons per year)	0.09	0.76	0.04	0.04
BAAQMD Thresholds (tons per year)	*10*	*10*	*15*	*10*
Exceed Threshold?	***No***	***No***	***No***	***No***
Average Daily Emissions (pounds per day)[1]	1.6	13.2	<1.0	<1.0

Scenario	ROG	NOx	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
BAAQMD Thresholds (pounds per day)	*54*	*54*	*82*	*54*
Exceed Threshold?	***No***	***No***	***No***	***No***

Source: Illingworth & Rodkin, 2014

Notes: [1] Based on 308 construction workdays

With regard to carbon monoxide emissions, congested intersections with a high volume of traffic have the most potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide has been at healthy levels (i.e., below state and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. The San Jose ambient air quality monitoring station measures carbon monoxide concentrations. The highest measured level over any 8-hour averaging period during the last 3 years is less than 2.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. Recognizing the relatively low carbon monoxide concentrations experienced in the Bay Area, the BAAQMD's CEQA Air Quality Guidelines state that a project would have a less-than-significant impact if it would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. The intersections affected by the proposed project have much lower traffic volumes (less than 10,000 vehicles per hour). As discussed further in Section 4.9, Traffic and Circulation, the project would result in minimal changes to area traffic patterns. Taking all of the above into account, the project would not cause or contribute to a violation of an ambient air quality standard.

Would the project create objectionable odors affecting a substantial number of people?

Construction activities, primarily the use of heavy equipment, may cause localized odors. Such odors would be temporary and are not anticipated to result in frequent odor complaints, although the proximity of residential uses to the bridge is acknowledged. Operation of the proposed project would not generate odors that would result in confirmed odor complaints; therefore, the impact would be less-than-significant and no mitigation is required.

Discussion of Significant Impacts

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

Impact AQ-1: Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Once operational, the proposed project would not substantially increase emissions of air pollutants. (LESS THAN SIGNIFICANT WITH MITIGATION)

The Bay Area is considered a non-attainment area for ground-level ozone and fine particulate matter ($PM_{2.5}$) under both the federal CAA and the California CAA. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}) under the California CAA, but not the federal CAA. The area has attained both California and federal ambient air quality standards for carbon monoxide.

Construction Emissions

Construction is anticipated to occur over a period of approximately 16 months (approximately 350 construction days, assuming an average of 22 workdays per month). Estimated emissions from cement truck trips, soil, and demolition hauling volumes were also included, as discussed below.

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. Therefore, **Mitigation Measure AQ-1** would implement pertinent best management practices set forth by BAAQMD.

Table 4.2-4 (above) provides a summary of the total annual and average daily criteria pollutant emissions from project construction activities, along with a comparison to the BAAQMD significance thresholds. As shown in **Table 4.2-4**, emissions of all pollutants are below the BAAQMD significance thresholds

Operational Emissions

As a bridge rehabilitation project, the proposed project would not widen the automobile lanes of traffic and thus would not generate new automobile trips. As a result, operational air pollutant emissions would not result in a significant impact. As stated above, the project is exempt from SIP project-level conformity requirements per 40 CFR 93.126. The project does not qualify as a project of air quality concern (POAQC) under EPA guidelines for particulate matter.

Mitigation Measure AQ-1: Include measures to control dust and exhaust during construction.

During demolition or any construction ground disturbance, implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less than significant. The contractor shall implement the following Best Management Practices that are required of all projects:

- 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 track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- 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.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after mitigation: Less than significant

Would the project expose sensitive receptors to substantial pollutant concentrations?

Impact AQ-2: Construction emissions would increase sensitive receptor exposure to pollutant concentrations for a temporary period of time. Once operational the project would not generate new air pollutant emissions. (LESS THAN SIGNIFICANT WITH MITIGATION)

Construction is anticipated to occur over a period of approximately 14 months. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Exposure to construction equipment and truck exhaust can cause increase cancer risks and other adverse non-cancer health effects. There are existing residences located north of the bridge adjacent to Kifer Road and east of Fair Oaks Avenue. There are also residences adjacent to both sides of the bridge just south of Caltrain tracks in the Heritage Park apartment community. Since existing residences are located near project construction areas, a refined health risk assessment of the construction activity was conducted that evaluated emissions of diesel particulate matter (DPM) and $PM_{2.5}$. Emissions and dispersion modeling was conducted to predict the off-site concentrations resulting from project construction so that lifetime cancer risks and non-cancer health effects could be evaluated. **Figure 4.2-1** shows the local project area, locations of the construction modeling sources, and sensitive receptor locations (residences) used in the air quality dispersion modeling analysis where potential impacts were evaluated.

Predicted Cancer Risk and Hazards

The maximum incremental child cancer risk at the maximally exposed individual (MEI) receptor would be 16.0 in one million and the adult incremental cancer risk would be 0.8 in one million, during construction. While the adult cancer risk would

be lower than the BAAQMD significance threshold of a cancer risk of 10 in one million or greater, the increased child cancer risk would be greater than the significance threshold and would be construed as a significant impact.

The maximum annual $PM_{2.5}$ concentration was 0.11 micrograms per cubic meter ($\mu g/m^3$) occurring at the same location where maximum cancer risk would occur. This $PM_{2.5}$ concentration is below the BAAQMD threshold of 0.3 $\mu g/m^3$ used to judge the significance of health impacts from $PM_{2.5}$.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. Non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). California's Office of Environmental Health and Hazards (OEHHA) has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The chronic inhalation reference exposure level (REL) for DPM is 5 $\mu g/m^3$. The maximum modeled annual DPM concentration was 0.11 $\mu g/m^3$, which is much lower than the REL. The maximum computed hazard index based on this DPM concentration is 0.022. This hazard index is much lower than the BAAQMD significance criterion of a hazard index greater than 1.0. **Appendix D** includes emissions calculations used for the area source modeling and the cancer risk calculations.

The project would have a significant impact with regard to the community risk caused by construction activities. Implementation of **Mitigation Measures AQ-1 and AQ-2** would reduce this impact to a less-than-significant level.

Mitigation Measure AQ-2: Diesel-Powered Construction Equipment Selection

Implement the following measures to minimize emissions from diesel equipment:

- All diesel-powered off-road equipment larger than 50 horsepower and operating at the site for more than two days continuously shall meet U.S. EPA particulate matter emissions standards for Tier 2 engines or equivalent;
- All stationary pieces of construction equipment shall use best available control technology to reduce particulate matter or shall be gasoline- or alternative energy-powered;
- Minimize the number of hours that equipment will operate, including the use of idling restrictions; and
- Avoid staging equipment within 100 feet of adjacent residences.

Implementation of **Mitigation Measure AQ-1** is considered to reduce exhaust emissions and corresponding health risks by 5 percent. Implementation of **Mitigation Measure AQ-2** would substantially reduce on-site diesel exhaust emissions. The computed maximum excess child cancer risk with implementation of **Mitigation Measures AQ-1 and AQ-2** would be 9.1 per million and the $PM_{2.5}$ concentration would be 0.06 µg/m.^{3} As a result, the project with mitigation measures would have a less-than-significant impact with respect to community risk caused by construction activities.

Significance after Mitigation: Less than significant.

4.2.4 REFERENCES

Illingworth & Rodkin. 2014. Fair Oak Overhead Bridge Rehabilitation Project Air Quality and Greenhouse Gas Emissions Assessment.

City of Sunnyvale. 2011. Sunnyvale General Plan. Available: http://ecityhall.sunnyvale.ca.gov/cd/GeneralPlan.pdf.

Figure 4.2-1 Sensitive Receptors

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