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Air Quality and Greenhouse Gas Emissions Analysis Report
Burbank Avenue Subdivision Project
City of Santa Rosa, Sonoma County, California

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AQI	Air Quality Index
AQP	Air Quality Plan
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
BAU	Business as Usual
BMP	Best Management Practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CCAA	California Clean Air Act
CCCC	California Climate Change Center
CDC	Centers for Disease Control and Prevention
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utility Commission
DPM	diesel particulate matter
du/acre	dwelling units per acre
EIR	Environmental Impact Report
EMFAC	Emission Factors
EPA	United States Environmental Protection Agency
GHG	greenhouse gas
HAP	hazardous air pollutant
IPCC	United Nations Intergovernmental Panel on Climate Change
ISO	Independent System Operator
ITE	Institute of Transportation Engineers
lb/MWh	pound per megawatt hour

lb/MWh	pounds per megawatt-hour
LCFS	Low Carbon Fuel Standard
LEV	Low Emission Vehicle
MMT	million metric tons
mpg	miles per gallon
mph	miles per hour
MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation Commission
MWh	megawatt-hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
ND	no data
NF_3	nitrogen trifluoride
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
OAL	Office of Administrative Law
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric
PM	particulate matter
ppb	parts per billion
ppm	parts per million
REL	Reference Exposure Level
ROG	reactive organic gases
RPS	renewables portfolio standard
SB	Senate Bill
SCP	Sonoma Clean Power
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SP	service population
TAC	toxic air contaminant
UNFCCC	United Nations Framework Convention on Climate Change
VMT	vehicle miles traveled
VOC	volatile organic compound
WELO	Water Efficient Landscape Ordinance
ZEV	zero-emission vehicles

SECTION 1: EXECUTIVE SUMMARY

1.1 - Purpose and Methods of Analysis

The following Air Quality and Greenhouse Gas (GHG) Emissions Analysis was prepared to evaluate whether the estimated criteria air pollutant, ozone precursor, and GHG emissions generated from the proposed Burbank Avenue Subdivision Project (proposed project) would cause significant impacts to air resources in the project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA) California Public Resources Code Sections 21000, et seq. The methodology follows Bay Area Air Quality Management District (BAAQMD) and City of Santa Rosa recommendations for quantification of emissions and evaluation of potential impacts to air resources.

1.2 - Project Summary

1.2.1 - Site Location

The proposed project site lies east of Burbank Avenue and opposite Roseland Creek Elementary School in the Roseland Neighborhood of the City of Santa Rosa. The proposed site is located on 14.6 acres comprised of four merged parcels located at 1400, 1690, 1720, and 1780 Burbank Avenue. The proposed project is located entirely within the City of Santa Rosa's Roseland Area/Sebastopol Road Specific Plan (Specific Plan),[1] which was approved by the City in 2016 in conjunction with the Roseland Area Annexation Project Environmental Impact Report (EIR).[2] The regional location is shown in Exhibit 1.

Surrounding land uses include residential single-family to the east and rural low-density residential single-family to the north, south, and southwest. Single-family residences directly border the proposed project site to the west, west, and south. Roseland Creek Elementary School borders the northwest corner of the site, while Sheppard Accelerated Elementary School borders the southeast corner of the project site. The site is currently occupied by one single-family residence, and four agricultural storage facilities (Exhibit 2).

1.2.2 - Project Description

The Burbank Avenue Subdivision Project proposes to demolish the existing residences and facilities and construct 62 lots for single-family units, 12 lots for duplex row houses and 64 affordable apartments. A total of 138 residential units are planned as part of the development. There is no commercial or industrial component. The proposed site has two entry roads off Burbank Avenue. An apartment complex is proposed along the southern entry road, and a duplex complex is proposed along the northern entry road; detached single-family dwellings are proposed across the remainder of the site. The tentative site plan is shown in Exhibit 3.

[1] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan. Website: https://srcity.org/DocumentCenter/View/18332/Roseland-AreaSebastopol-Road-Specific-Plan?bidId=. Accessed October 16, 2019.

[2] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects Final Environmental Impact Report. August. Website: https://srcity.org/DocumentCenter/View/14671. Accessed September 24, 2019.

Project zoning is R-1-6 and the Specific Plan designated the site Medium-Low Density Residential. According to the Santa Rosa General Plan 2035, the Medium-Low density classification permits between 8-13 units per acre and is intended for attached single-family residential development, but single-family detached housing and multi-family development may also be permitted.[3] The General Plan states that development at the mid-point of the density range is desirable but not required. Utilizing a mid-point of 10 dwelling units per acre (du/acre), the midpoint development for this site would be 146 units.[4]

The proposed project would be constructed in five phases, with construction beginning in 2021 and project buildout being completed in 2025. Each phase would become operational once it is completed, as construction of subsequent phases occurs. The acreage associated with Phases 3, 4, and 5 would be used for construction staging during the construction of Phases 1 and 2.

Phase 1 would include construction of the proposed apartment buildings on Parcel A in the southwest corner of the project site; storm drain pipes across the southern section of the project site; Public Road 4 north of the apartment buildings; Private Road 1 south of the apartment buildings; Private Roads D and E between the apartment buildings; Public Road A east of the apartment buildings; and sewer and water main improvements along Burbank Avenue adjacent to the southern half of the project site.

Phase 2 would include construction of five proposed single-family houses on lots 55-59, and the adjacent section of Public Road A.

Phase 3 would include construction of 23 proposed single-family houses on Lots 21-25, 32-37, 46-54, and 60-62, and sections of Public Roads 3 and A contained within this area.

Phase 4 would include construction of the 12 proposed duplex row houses on Lots 63-74, the section of Public Road 1 from Burbank Avenue to Public Road A, and improvements along Burbank Avenue adjacent to these lots.

Phase 5 would include construction of 34 proposed single-family houses on Lots 1-20, 26-31, and 38-45, and sections of Public Roads B, 1, 3, and 5 within this area.

1.3 - Summary of Analysis Results

The following is a summary of the Air Quality and GHG Emissions Analysis results. As shown below, the proposed project would result in less than significant impacts for all air quality and GHG impact criteria analyzed. Furthermore, the proposed project would be consistent with the policies and mitigation measures of the General Plan EIR and the 2016 Specific Plan EIR.

[3] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan. November. Website: https://srcity.org/428/Roseland-Area-Sebastopol-Road-Specific-P. Accessed September 13, 2019.

[4] City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035. November 3. Website: https://srcity.org/392/General-Plan. Accessed September 13, 2019.

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

Impact AIR-2: Implementation of MM 3.3.3 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR, would ensure the project would not violate air quality standards or contribute substantially to an existing or projected air quality violation.
Less than significant impact.

Impact AIR-3: Implementation of MM 3.3.3 and MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR, would ensure the project would not 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, which exceed quantitative thresholds for ozone precursors).
Less than significant impact.

Impact AIR-4: The project would not expose sensitive receptors to substantial pollutant concentrations.
Less than significant impact.

Impact AIR-5: The project would not create objectionable odors affecting a substantial number of people.
Less than significant impact.

Impact GHG-1: The project would generate direct and indirect GHG emissions; however, the project would not result in a significant impact on the environment.
Less than significant impact.

Impact GHG-2: The project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of GHG.
Less than significant impact.

1.4 - Mitigation Measures Applied to the Project

Air Quality

MM 3.3.3 and MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR.

Greenhouse Gas Emissions

No mitigation is required.

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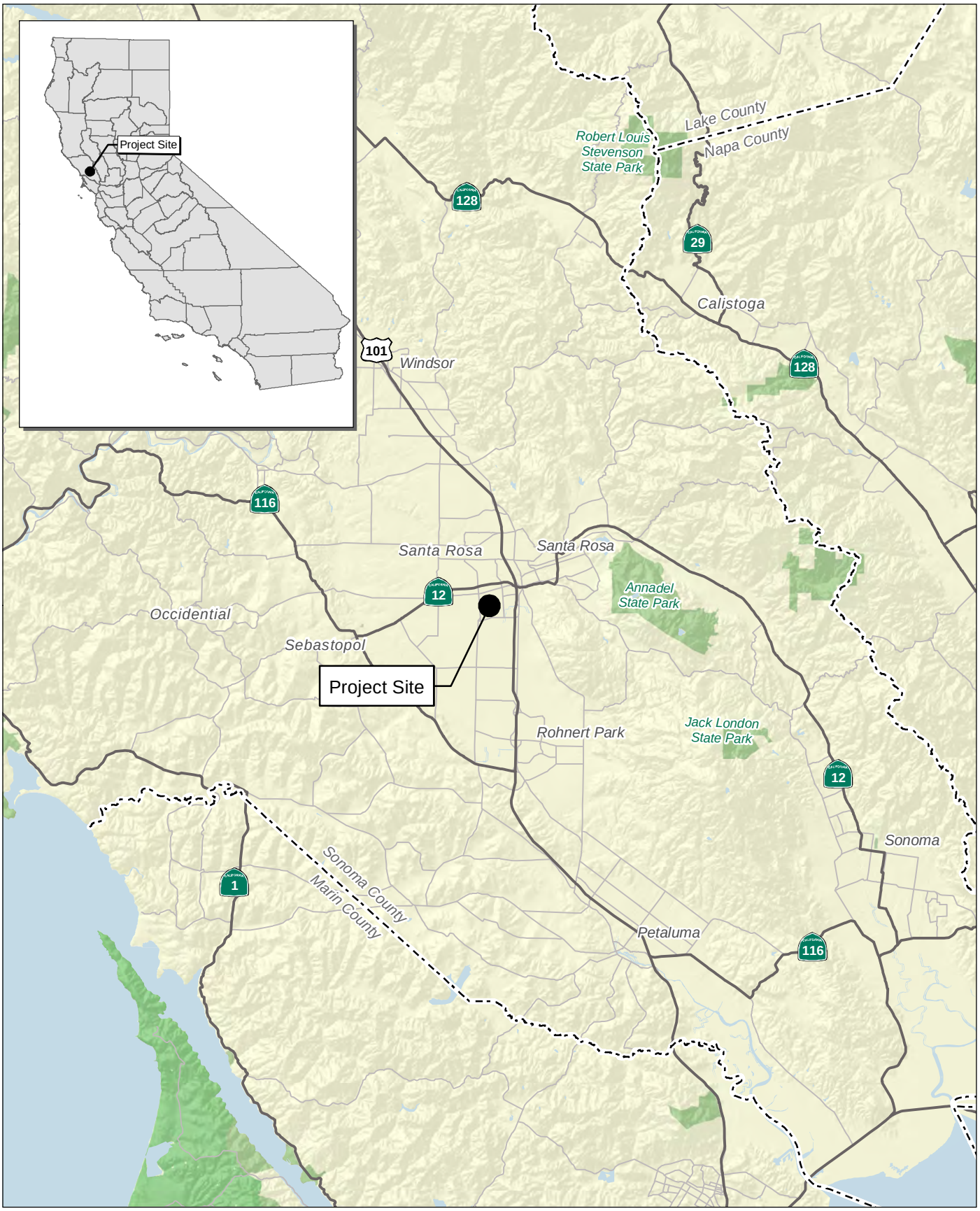

Source: Census 2000 Data, The CaSIL

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5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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SCHELLINGER BROTHERS
BURBANK AVENUE SUBDIVISION PROJECT
AIR QUALITY AND GREENHOUSE GAS EMISSIONS ANALYSIS REPORT

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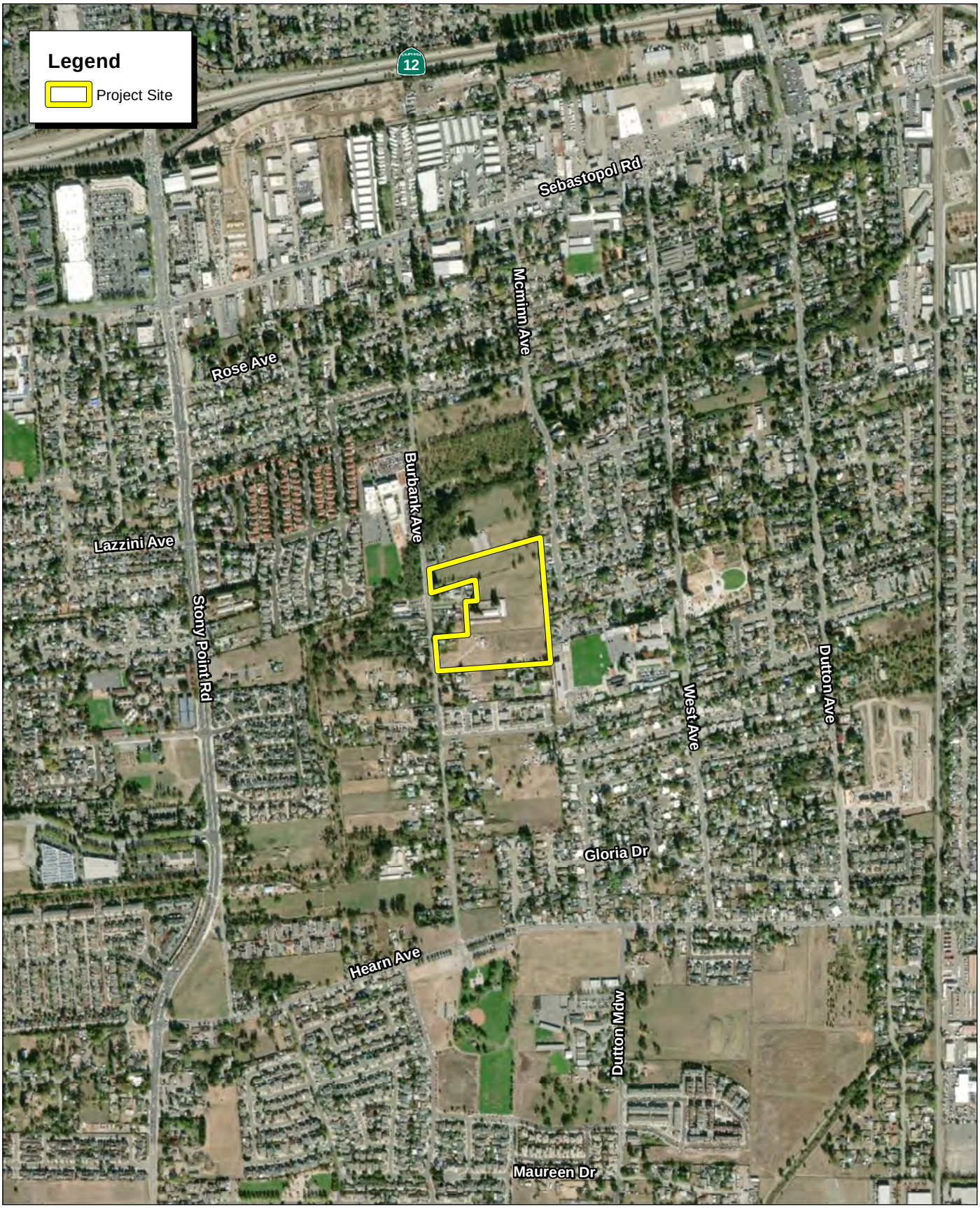

Source: ESRI Aerial Imagery.

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1,000 500 0 1,000
Feet

Exhibit 2
Local Vicinity Map
Aerial Base

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Source: Jon Woden Architects, August 10, 2019.

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Exhibit 3
Site Plan

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SECTION 2: AIR QUALITY SETTING

2.1 - Environmental Setting

The proposed project is located in the City of Santa Rosa and is within the San Francisco Bay Area Air Basin (Air Basin). Regional and local air quality are impacted by topography, dominant airflows, atmospheric inversions, location, and season. The following section describes these conditions as they pertain to the Air Basin.

2.1.1 - San Francisco Bay Area Air Basin

The San Francisco Bay Area has a Mediterranean climate characterized by mild, dry summers and mild, moderately wet winters; moderate daytime onshore breezes, and moderate humidity. The North Bay region of the Bay Area extends from the Golden Gate Bridge northward to Santa Rosa and eastward to Fairfield.

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

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

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the gap in the western Coast Ranges, known as the Golden Gate, and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate[5] produces a jet that sweeps eastward but widens downstream, producing southwest winds at Berkeley and northwest winds at San José; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Golden Gate, the Carquinez Strait, or San Bruno Gap.

[5] A strait on the west coast of North America that connects the San Francisco Bay to the Pacific Ocean.

The sea breeze between the coast and the Central Valley[6] commences near the surface along the coast in late morning or early afternoon; it may first be observed only through the Golden Gate. Later in the day, the layer deepens and intensifies while spreading inland. As the breeze intensifies and deepens, it flows over the lower hills farther south along the peninsula. This process frequently can be observed as a bank of stratus clouds "rolling over" the coastal hills on the west side of the bay. The depth of the sea breeze depends in large part upon the height and strength of the inversion. The generally low elevation of this stable layer of air prevents marine air from flowing over the coastal hills. It is unusual for the summer sea breeze to flow over terrain exceeding 2,000 feet in elevation.

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

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

2.2 - Regulatory Setting

Air pollutants are regulated to protect human health and for secondary effects such as visibility and building soiling. The Clean Air Act of 1970 tasks the EPA with setting air quality standards. The State of California also sets air quality standards that are in some cases more stringent than federal standards, and address additional pollutants. The following section describes these federal and State standards and the health effects of the regulated pollutants.

2.2.1 - Clean Air Act

Congress established much of the basic structure of the Clean Air Act (CAA) in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the CAA. The EPA calls these pollutants criteria air pollutants because it regulates them by developing human health-based and environmentally based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health are called primary standards. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health. Another set of limits intended to prevent environmental and property damage are called secondary standards.[7] The federal standards are called National Ambient Air

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

[7] United States Environmental Protection Agency (EPA). 2016. NAAQS Table. December 20. Website: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed August 27, 2019.

Quality Standards (NAAQS). The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards. The criteria pollutants are:

- Ozone
- Nitrogen dioxide (NO_2)
- Lead
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)

The federal standards were set to protect public health, including that of sensitive individuals; thus, the EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants.

2.2.2 - California Clean Air Act

The California Legislature enacted the California Clean Air Act (CCAA) in 1988 to address air quality issues of concern not adequately addressed by the federal CAA at the time. California's air quality problems were and continue to be some of the most severe in the nation, and required additional actions beyond the federal mandates. The California Air Resources Board (ARB) administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the CCAA. The 10 State air pollutants are the six federal standards listed above as well as visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The EPA authorized California to adopt its own regulations for motor vehicles and other sources that are more stringent than similar federal regulations implementing the CAA. It should be noted that the EPA recently rescinded California's waiver for its GHG and zero-emission vehicle mandates; however, all ARB standards are still in effect at the time of this writing.[8] Generally, the planning requirements of the CCAA are less stringent than the federal CAA; therefore, consistency with the CAA will also demonstrate consistency with the CCAA.

2.2.3 - Toxic Air Contaminants

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. There are no ambient air quality standards for TAC emissions. TACs are regulated in terms of health risks to individuals and populations exposed to the pollutants. The 1990 Clean Air Act Amendments significantly expanded the EPA's authority to regulate hazardous air pollutants (HAP). Section 112 of the CAA lists 187 hazardous air pollutants to be regulated by source category. Authority to regulate these pollutants was delegated to individual states. The ARB and local air districts regulate TACs and HAPs in California.

2.2.4 - Air Pollutant Description and Health Effects

The federal and State ambient air quality standards, relevant effects, properties, and sources of the air pollutants are summarized in Table 1.

[8] Beveridge & Diamond PC. 2019. EPA Rescinds California's Authority to Regulate Vehicle Tailpipe Greenhouse Gas Emissions and to Implement a Zero-Emission Vehicle Program. September 24. Website: https://www.jdsupra.com/legalnews/epa-rescinds-california-s-authority-to-72922/. Accessed November 26, 2019.

Table 1: Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	—	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), nitrogen oxides (NO_X), and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind. Hot, sunny, and calm weather conditions are favorable to ozone formation.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_X) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.070 ppm[f]			
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm	Ranges depend on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm[g]	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contribution to atmospheric discoloration; increased visits to hospital for respiratory illnesses.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides—NO_X (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NO_X is a precursor to ozone, PM_{10}, and $PM_{2.5}$ formation. NO_X can react with compounds to form nitric acid and related small particles and result in PM-related health effects.	NO_X is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Nitrogen dioxide (NO_2) forms quickly from NO_X emissions. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.
	Annual	0.030 ppm	0.053 ppm			

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur dioxide[c] (SO_2)	1 Hour	0.25 ppm	0.075 ppm	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO_x) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM_{10}.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards.
	3 Hour	—	0.5 ppm			
	24 Hour	0.04 ppm	0.14 (for certain areas)			
	Annual	—	0.030 ppm (for certain areas)			
Particulate matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	• Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. • Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is between 2.5 and 10 microns in diameter, (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation-related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.
	Mean	20 µg/m^3	—			
Particulate matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3			
	Annual	12 µg/m^3	12 µg/m^3			
Visibility-reducing particles	8 Hour	See note below[d]				

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfates	24 Hour	25 µg/m^3	—	Decrease in ventilatory function; aggravation of asthmatic symptoms; aggravation of cardio-pulmonary disease; vegetation damage; degradation of visibility; and property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO_4^{2-}. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.
Lead[e]	30-day	1.5 µg/m^3	—	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.
	Quarter	—	1.5 µg/m^3			
	Rolling 3-month average	—	0.15 µg/m^3			
Vinyl chloride[e]	24 Hour	0.01 ppm	—	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.
Hydrogen sulfide	1 Hour	0.03 ppm	—	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Volatile organic compounds (VOC)		There are no state or federal standards for VOCs because they are not classified as criteria pollutants.		Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as toxic air contaminants.	Reactive organic gases (ROG), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROG and VOCs, the two terms are often used interchangeably.	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.
Diesel particulate matter (DPM)		There are no ambient air quality standards for DPM.		Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.	DPM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources

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

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

[b] To attain the 1-hour NO_2 national standard, the 3-year average of the annual 98^{th} percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb) (0.100 ppm).

[c] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99^{th} percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

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

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

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

[g] The official level of the 1-hour NO_2 standard is 100 ppb, equal to 0.100ppm, which is shown here for the purpose of clearer comparison to the other standards.

Source of effects, properties, and sources: South Coast Air Quality Management District 2007; California Environmental Protection Agency 2002; California Air Resources Board 2009a; U.S. Environmental Protection Agency 2003, 2009, 2009b, 2010, 2011, and 2012a; National Toxicology Program 2011a and 2011b and 2016.
Source of standards: California Air Resources Board 2016a.

Several pollutants listed in Table 1 are not addressed in this analysis. Analysis of lead is not included in this report because no new sources of lead emissions are anticipated with the proposed project. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed as PM_{10} and $PM_{2.5}$. No components of the proposed project would result in vinyl chloride or hydrogen sulfide emissions in any substantial quantity.

Toxic Air Contaminants Health Effects

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. The California Almanac of Emissions and Air Quality—2009 Edition, presents the relevant concentration and cancer risk data for the 10 TACs that pose the most substantial health risk in California based on available data.[9] The 10 TACs are acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and DPM.

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk.[10]

In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

DPM differs from other TACs in that it is not a single substance, but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, however, no ambient monitoring data are available for DPM because no routine measurement method currently exists. The ARB has made preliminary concentration estimates based on a DPM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of DPM.

Asbestos

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and

[9] California Air Resources Board (ARB). 2009. The California Almanac of Emissions and Air Quality—2009 Edition. Website: https://www.arb.ca.gov/aqd/almanac/almanac09/almanac2009 all.pdf.

[10] California Air Resources Board (ARB). 1998. The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines. Website: www.arb.ca.gov/toxics/dieseltac/factsht1.pdf.

crocidolite. Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States. Exposure to asbestos is a health threat; exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease that causes scarring of the lungs). Exposure to asbestos can occur during demolition or remodeling of buildings that were constructed prior to the 1977 ban on asbestos for use in buildings. Exposure to naturally occurring asbestos can occur during soil-disturbing activities in areas with deposits present. The nearest location likely to contain naturally occurring asbestos is located 8.9 miles east of the proposed project site.[11]

2.3 - Existing Air Quality Conditions

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. Table 2 summarizes 2016 through 2018 published monitoring data, which is the most recent 3-year period available. The table displays data from the Sebastopol-103 Morris Street air monitoring station, which is located approximately 4.7 miles west of the project site, and data from the Healdsburg-133 Matheson Street air monitoring station, which is located approximately 15 miles northwest of the project site. The data shows that during the past few years, the project area has exceeded the standards for ozone (California and national), PM_{10} (California and national), and $PM_{2.5}$ (national). The data in the table reflects the concentration of the pollutants in the air, measured using air monitoring equipment. This differs from emissions, which are calculations of a pollutant being emitted over a certain period. No recent monitoring data for Sonoma County was available for CO or SO_2. Generally, no monitoring is conducted for pollutants that are no longer likely to exceed ambient air quality standards.

Table 2: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2016	2017	2018
Ozone[1]	1 Hour	Max 1 Hour (ppm)	0.073	0.087	0.071
		Days > State Standard (0.09 ppm)	0	0	0
	8 Hour	Max 8 Hour (ppm)	0.065	**0.072**	0.053
		Days > State Standard (0.07 ppm)	0	1	0
		Days > National Standard (0.07 ppm)	0	1	0
Carbon monoxide (CO)	8 Hour	Max 8 Hour (ppm)	ND	ND	ND
		Days > State Standard (9.0 ppm)	ND	ND	ND
		Days > National Standard (9 ppm)	ND	ND	ND

[11] California Department of Conservation, Division of Mines and Geology. 2000. A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos. August. Website: https://ww3.arb.ca.gov/toxics/asbestos/ofr_2000-019.pdf. Accessed October 7, 2019.

Table 2 (cont.): Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2016	2017	2018
Nitrogen dioxide (NO_2)[1]	Annual	Annual Average (ppm)	0.004	0.004	0.004
	1 Hour	Max 1 Hour (ppm)	0.031	0.034	0.065
		Days > National Standard (0.1 ppm)	0	0	0
Sulfur dioxide (SO_2)	Annual	Annual Average (ppm)	ND	ND	ND
	24 Hour	Max 24 Hour (ppm)	ND	ND	ND
		Days > State Standard (0.04 ppm)	ND	ND	ND
Inhalable coarse particles (PM_{10})[2]	Annual	Annual Average ($\mu g/m^3$)	13.8	17.4	19.3
	24 hour	24 Hour ($\mu g/m^3$)	43.5	**161.5**	**278.6**
		Days > State Standard (50 $\mu g/m^3$)	0	**7**	**13**
		Days > National Standard (150 $\mu g/m^3$)	0	**1**	**2**
Fine particulate matter ($PM_{2.5}$)[1]	Annual	Annual Average ($\mu g/m^3$)	4.6	8.1	8.3
	24 Hour	24 Hour ($\mu g/m^3$)	18.7	**81.8**	**175.3**
		Days > National Standard (35 $\mu g/m^3$)	0.0	4.0	13.1

Notes:
> = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter
ND = no data max = maximum
Bold = exceedance
State Standard = California Ambient Air Quality Standard
National Standard = National Ambient Air Quality Standard
[1] Sebastopol-103 Morris Street Monitoring Station
[2] Healdsburg-133 Matheson Street Monitoring Station
Source: California Air Resources Board (ARB). 2018. iADAM: Air Quality Data Statistics. Website: https://www.arb.ca.gov/adam/. Accessed November 30, 2018.

The health impacts of the various air pollutants of concern can be presented in a number of ways. The clearest comparison is to the state and federal ozone standards. Air concentration below standards indicate that health risks are sufficiently low enough to have a minimal impact on public health, as there is no such thing as a zero-risk level. When concentrations exceed the standards, impacts will vary based on the amount by which the standard is exceeded. The EPA developed the Air Quality Index (AQI) as an easy-to-understand measure of health impacts compared with concentrations in the air. Table 3 provides a description of the health impacts of ozone at different concentrations.

Table 3: Air Quality Index and Health Effects from Ozone

Air Quality Index/ 8-hour Ozone Concentration	Health Effects Description
AQI 100—Moderate	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 75 ppb	**Health Effects Statements**: Unusually sensitive individuals may experience respiratory symptoms.
	Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.
AQI 150—Unhealthy for Sensitive Groups	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 95 ppb	**Health Effects Statements**: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
AQI 200—Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 115 ppb	**Health Effects Statements**: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
AQI 210—Very Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 139 ppb	**Health Effects Statements**: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
Source: Air Now. 2015. AQI Calculator: AQI to Concentration. Website: http://www.airnow.gov/index.cfm?action=resources.aqi_conc_calc. Accessed February 2019.	

The highest reading for the 8-hour ozone standard for the last three years at the Sebastopol-103 Morris Street monitoring station was 0.072 parts per million (ppm) in 2017, which is below the 115 ppb cutoff point for Unhealthy (AQI 200) and the 139 ppb cutoff for Very Unhealthy (AQI 210).

2.3.1 - Attainment Status

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards.

Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

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

Table 4: San Francisco Bay Area Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$	Nonattainment	Nonattainment
Sulfates	Attainment	N/A
Hydrogen Sulfates	Unclassified	N/A
Visibility-reducing Particles	Unclassified	N/A
Lead	N/A	Attainment
Source: Bay Area Air Quality Management District (BAAQMD). 2017. Air Quality Standards and Attainment Status. January. Website: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed August 2019.		

2.4 - Air Quality Plans and Regulations

Air pollutants are regulated at the national, state, and air basin or county level; each agency has a different level of regulatory responsibility. The EPA regulates at the national level. The ARB regulates at the state level. The BAAQMD regulates at the air basin level.

The EPA is responsible for national and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards, also known as the federal standards described earlier.

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

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

2.4.1 - California Regulations

Low-Emission Vehicle Program

The ARB first adopted Low Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represented continuing progress in emission reductions. As the State's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, the more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 SIP. In 2012, ARB adopted the LEV III amendments to California's LEV regulations. These amendments, also known as the Advanced Clean Car Program include more stringent emission standards for model years 2017 through 2025 for both criteria pollutants and GHGs for new passenger vehicles.[12]

On-Road Heavy-Duty Vehicle Program

The ARB has adopted standards for emissions from various types of new on-road heavy-duty vehicles. Section 1956.8, Title 13, California Code of Regulations contains California's emission standards for on-road heavy-duty engines and vehicles, and test procedures. The ARB has also adopted programs to reduce emissions from in-use heavy-duty vehicles including the Heavy-Duty

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

Diesel Vehicle Idling Reduction Program, the Heavy-Duty Diesel In-Use Compliance Program, the Public Bus Fleet Rule and Engine Standards, and the School Bus Program and others.[13]

ARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the ARB adopted a regulation to reduce DPM and NO_X emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each vehicle in violation. Performance requirements of the rule are based on a fleet's average NO_X emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements, making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

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

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

ARB Airborne Toxic Control Measure for Asbestos

In July 2001, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying, and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. The measure establishes specific testing, notification and engineering controls prior to grading, quarrying, or surface mining in construction zones where naturally occurring asbestos is located on projects of any size. There are additional notification and engineering controls at work sites larger than 1 acre in size. These projects require the submittal of a "Dust Mitigation Plan" and approval by the air district prior to the start of a project.

Construction sometimes requires the demolition of existing buildings where construction occurs; however, no demolition is proposed as part of the project. In addition, asbestos is also found in a

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

natural state, known as naturally occurring asbestos. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers into the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The measure also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity. Review of the Department of Conservation maps indicates that the nearest ultramafic rock is located 8.9 miles east of the proposed project site.[14]

Diesel Risk Reduction Plan

The ARB's Diesel Risk Reduction Plan has led to the adoption of new state regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce DPM emissions by about 90 percent overall from year 2000 levels. The projected emission benefits associated with the full implementation of this plan, including federal measures, are reductions in DPM emissions and associated cancer risks of 75 percent by 2010, and 85 percent by 2020.[15]

2.4.2 - Bay Area Air Quality Management District

Standard Conditions

During construction and operation, the project must comply with applicable rules and regulations. The following are rules and regulations the project may be required to comply with, either directly or indirectly.

BAAQMD 2017 Clean Air Plan

The BAAQMD adopted the Bay Area Clean Air Plan: Spare the Air, Cool the Climate (Bay Area Clean Air Plan) on April 19, 2017, to provide a regional strategy to improve Bay Area air quality and meet public health goals.[16] The control strategy described in the Bay Area Clean Air Plan includes a wide range of control measures designed to reduce emissions and lower ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce GHG emissions to protect the climate.

[14] California Department of Conservation, Division of Mines and Geology. 2000. A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos. August. Website: https://ww3.arb.ca.gov/toxics/asbestos/ofr_2000-019.pdf. Accessed October 7, 2019.

[15] California Air Resources Board (ARB). 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles. Website: http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed September 22, 2017.

[16] Bay Area Air Quality Management District (BAAQMD). 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed April 24, 2018.

The Bay Area Clean Air Plan addresses four categories of pollutants: ground-level ozone and its key precursors, ROG and NO_X; PM, primarily $PM_{2.5}$, and precursors to secondary $PM_{2.5}$; air toxics; and GHGs. The control measures are categorized based on the economic sector framework including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, and water measures.[17]

BAAQMD Particulate Matter Plan

To fulfill federal air quality planning requirements, the BAAQMD adopted a $PM_{2.5}$ emissions inventory for year 2010 at a public hearing on November 7, 2012. The Bay Area Clean Air Plan also included several measures for reducing PM emissions from stationary sources and wood burning. On January 9, 2013, the EPA issued a final rule determining that the Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS, suspending federal SIP planning requirements for the Air Basin.[18] Despite this EPA action, the Air Basin will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until BAAQMD submits a redesignation request and a maintenance plan to EPA, and EPA approves the proposed redesignation.

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

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

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

BAAQMD 2001 Ozone Attainment Plan

The BAAQMD adopted the Bay Area Ozone Attainment Plan in 2001 in response to EPA's finding that the Bay Area had failed to attain the NAAQS for ozone. The plan includes a control strategy for ozone and its precursors to ensure a reduction in emissions from stationary sources, mobile sources, and the transportation sector.[19]

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[17] Bay Area Air Quality Management District (BAAQMD). 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed April 24, 2018.

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

[19] Bay Area Air Quality Management District (BAAQMD). 2001. Revised San Francisco Bay Area Ozone Attainment Plan for the 1-Hour

Because the Air Basin is nonattainment for the federal and State ozone standards, the BAAQMD prepared an Ozone Attainment Demonstration Plan to satisfy the federal 1-hour ozone planning requirement and a CAP to satisfy the State 1-hour ozone planning requirement. The EPA revoked the 1-hour ozone standard and adopted an 8-hour ozone standard.

On May 2017, the BAAQMD adopted the final Bay Area 2017 Clean Air Plan.[20] The 2017 Clean Air Plan was prepared by the BAAQMD in cooperation with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG). The goals of the 2017 Clean Air Plan are to reduce regional air pollutants and climate pollutants to improve the health of Bay Area residents for the next decades. The 2017 Clean Air Plan aims to lead the region into a post-carbon economy, continue progress toward attaining all state and federal air quality standards, and eliminate health risk disparities from air pollution exposure in Bay Area communities. The 2017 Clean Air Plan includes 85 distinct control measures to help the region reduce air pollutants and has a long-term strategic vision that forecasts what a clean air Bay Area will look like in year 2050. The 2017 Clean Air Plan envisions a future where by the year 2050:

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

The focus of control measures includes aggressively targeting the largest source of GHG, ozone pollutants and particulate matter emissions—transportation. This includes more incentives for electric vehicle infrastructure, off-road electrification projects such as Caltrain (a California commuter rail line on the San Francisco Peninsula and in the Santa Clara Valley), and shore power at ports that would reduce emissions from trucks, school buses, marine vessels, locomotives, and off-road equipment. Additionally, the BAAQMD will continue to work with regional and local governments to reduce vehicle miles traveled through the further funding of rideshare, bike and shuttle programs.

National Ozone Standard. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2001-ozone-attainment-plan/oap_2001.pdf. Accessed June 5, 2018.

[20] Bay Area Air Quality Management District (BAAQMD). 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed April 24, 2018.

BAAQMD Regulation 2, Rule 5 (New Source Review Permitting)

The BAAQMD regulates backup emergency generators, fire pumps, and other sources of TACs through its New Source Review (Regulation 2, Rule 5) permitting process.[21] Although emergency generators are intended to be used only during periods of power outages, monthly testing of each generator is required; however, the BAAQMD limits testing to no more than 50 hours per year. Each emergency generator installed is assumed to meet a minimum of Tier 2 emission standards (before control measures). As part of the permitting process, the BAAQMD limits the excess cancer risk from any facility to no more than 10 per 1 million population for any permits that are applied for within a 2-year period and would require any source that would result in an excess cancer risk greater than 1 per 1 million to install Best Available Control Technology for Toxics.

BAAQMD Regulation 8, Rule 3 (Architectural Coatings)

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

BAAQMD Regulation 8, Rule 15 (Emulsified and Liquid Asphalts)

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

BAAQMD Regulations Pertaining to Odorous Emissions

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

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

[21] Bay Area Air Quality Management District (BAAQMD). 2016. Complex Permitting Book for BAAQMD New Source Review Permitting. September.

ABAG and MTC Plan Bay Area

On July 18, 2013, the Metropolitan Transportation Commission (MTC) and the ABAG approved the Plan Bay Area. The Plan Bay Area includes integrated land use and transportation strategies for the region and was developed through OneBayArea, a joint initiative between the ABAG, BAAQMD, MTC, and the San Francisco Bay Conservation and Development Commission. The plan's transportation policies focus on maintaining the extensive existing transportation network and utilizing these systems more efficiently to handle density in Bay Area transportation cores.[22] Assumptions for land use development used are taken from local and regional planning documents. Emission forecasts in the Bay Area Clean Air Plan rely on projections of vehicle miles traveled, population, employment, and land use projections made by local jurisdictions during development of Plan Bay Area. On July 26, 2017, the MTC and ABAG adopted the Plan Bay Area 2040, which uses updated planning assumptions that incorporate economic, demographic, and financial trends since the original Plan Bay Area.[23]

2.4.3 - Local Regulations

Santa Rosa General Plan 2035

The City of Santa Rosa General Plan 2035, adopted in 2009, establishes the following goals and policies that are relevant to air quality:[24]

- **OSC-J:** Take appropriate actions to help Santa Rosa and the larger Bay Area region achieve and maintain all ambient air quality standards.
- **OSC-J-1:** Review all new construction projects and require dust abatement actions as contained in the CEQA Handbook of the Bay Area Air Quality Management District.
- **OSC-J-2:** Budget for clean fuels and vehicles in the city's long-range capital expenditure plans, to replace and improve the existing fleet of gasoline and diesel powered vehicles. Initiate a policy to make its fleet among the cleanest in the North Bay by:
  - Purchasing electric vehicles wherever possible, and especially for stop-and-go units such as parking meter readers.
  - Purchasing electric or hybrid electric fleet vehicles for general staff use, especially for building inspectors and other uses primarily within the city.
  - Purchasing alternative fuel vehicles, such as natural gas, as the existing diesel-powered fleet is replaced. Alternatively, purchase diesel vehicles only if they meet or exceed emission specifications for available natural gas fuel vehicles.
  - Purchasing biodiesel fuel for use by the city diesel truck fleet.
  - As possible, use lo-NO_X fuel additives, such as Purinox, in all diesel vehicles.
- **OSC-J-3:** Reduce particulate matter emissions from wood burning appliances through implementation of the city's Wood Burning Appliance code.

[22] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). 2013. Plan Bay Area. July 18. Website: https://mtc.ca.gov/sites/default/files/0-Introduction.pdf. Accessed September 25, 2019.

[23] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). 2017. Plan Bay Area 2040. July 26. Website: https://mtc.ca.gov/sites/default/files/Final_Plan_Bay_Area_2040.pdf. Accessed September 25, 2019.

[24] City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035. November 3. Website: https://srcity.org/392/General-Plan. Accessed September 13, 2019.

Santa Rosa City Code

Applicable performance standards related to air quality from Santa Rosa City Code 20-30.090[25] are provided below:

- **Air emissions.** No visible dust, gasses, or smoke shall be emitted, except as necessary for the heating or cooling of structures, and the operation of motor vehicles on the site.
- **Dust.** Activities that may generate dust emissions (e.g., construction, grading, commercial gardening, and similar operations) shall be conducted to limit the emissions beyond the site boundary to the maximum extent feasible. Appropriate methods of dust management shall include the following, subject to approval by the City Engineer.
  1 Scheduling. Grading shall be designed and grading activities shall be scheduled to ensure that repeat grading will not be required, and that completion of the dust-generating activity (e.g., construction, paving or planting) will occur as soon as possible.
  2 Operations during high winds. Clearing, earth-moving, excavation operations or grading activities shall cease when the wind speed exceeds 25 miles per hour averaged over one hour.
  3 Limiting the area of disturbance. The area disturbed by clearing, demolition, earth-moving, excavation operations or grading shall be minimized at all times.
  4 Dust control. Fugitive dust emissions shall be controlled by watering a minimum of two times each day, paving or other treatment of permanent on-site roads and construction roads, the covering of trucks carrying loads with dust content, and/or other dust-preventive measures (e.g., hydroseeding, etc.).
  5 Revegetation. Graded areas shall be revegetated as soon as possible, but within no longer than 30 days, to minimize dust and erosion. Disturbed areas of the construction site that are to remain inactive longer than three months shall be seeded and watered until grass cover is grown and maintained; and
  6 Fencing. Appropriate fences or walls shall be constructed to contain dust within the site as required by the City Engineer.
- **Odor.** No obnoxious odor or fumes shall be emitted that are perceptible without instruments by a reasonable person at the property line of the site.

Santa Rosa General Plan 2035 EIR

The certified EIR for the Santa Rosa General Plan 2035 was approved in June 2009.[26] The Air Quality and Climate Change section of the General Plan EIR discusses the exposure of people, especially sensitive individuals, to unhealthful pollutant concentrations generated by construction and operation of development projects, and considers the effects of emissions of criteria air pollutants, TACs, and GHG's. The General Plan EIR does not recommend any mitigation measures that are applicable to this project beyond the General Plan 2035 policies.

[25] City of Santa Rosa. 2019. Santa Rosa City Code. Website: https://qcode.us/codes/santarosa/. Accessed September 16, 2019.
[26] City of Santa Rosa. 2009. Santa Rosa General Plan 2035 EIR. June. Website: https://srcity.org/392/General-Plan. Accessed September 16, 2019.

Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR

The proposed project site is comprised of four parcels located entirely within the City of Santa Rosa's Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects, which were approved by the City in 2016. The Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR determined that future development projects would require further CEQA review of project-level traffic impacts, and associated air emissions, prior to implementation. The EIR includes the following mitigation measures that are applicable to the proposed project.[27]

MM 3.3.3 Where projects in the project area are subject to subsequent CEQA review, the City of Santa Rosa must ensure that in addition to the BAAQMD basic construction mitigation measures from Table 8-1 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates), BAAQMD additional mitigation measures from Table 8-2 of the BAAQMD CEQA Air Quality Guidelines (or subsequent updates) are noted on the construction documents and implemented. These measures include the following:

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
9. Minimizing the idling time of diesel powered construction equipment to two minutes.
10. The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average

[27] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR. August. Website: https://srcity.org/428/Roseland-Area-Sebastopol-Road-Specific-P. Accessed September 16, 2019.

20 percent NO_X reduction and 45 percent PM reduction compared to the most recent CARB fleet average.

11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NO_X and PM.
13. Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

Timing/Implementation: Implemented during construction activities for subsequent projects within the project area

Enforcement/Monitoring: City of Santa Rosa Planning and Economic Development Department, Planning Division

MM 3.3.5 Projects within the project area that have a construction area greater than 5 acres and which are scheduled to last more than two years shall be required to prepare a site-specific construction pollutant mitigation plan in consultation with Bay Area Air Quality Management District (BAAQMD) staff prior to the issuance of grading permits. A project specific construction-related dispersion model acceptable to the BAAQMD shall be used to identify potential toxic air contaminant impacts, including diesel particulate matter. If BAAQMD risk thresholds (i.e., probability of contracting cancer is greater than 10 in one million) would be exceeded, mitigation measures shall be identified in the construction pollutant mitigation plan to address potential impacts and shall be based on site-specific information, such as the distance to the nearest sensitive receptors, project site plan details, and construction schedule. The City shall ensure construction contracts include all identified measures. Construction pollutant mitigation plan measures shall include but not be limited to limiting the amount of acreage to be graded in a single day, requiring the use of advanced particulate filters on construction equipment, and requiring the use of alternative fuels, such as biodiesel, to power construction equipment.

Timing/Implementation: Modeling shall be completed prior to grading permit issuance, and measures implemented during construction activities for subsequent projects with a construction area greater than 5 acres and construction lasting more than two years

Enforcement/Monitoring: City of Santa Rosa Planning and Economic Development Department, Planning Division

MM 3.3.6 The following measures shall be utilized in site planning and building designs to reduce TAC and $PM_{2.5}$ exposure where new receptors are located within 1,000 feet of emissions sources:

- Future development in the project area that includes sensitive receptors (such as residences, schools, hospitals, daycare centers, or retirement homes) located within 1,000 feet of US 101 and/or stationary sources shall require site-specific analysis to determine the level of health risk. This analysis shall be conducted following procedures outlined by the BAAQMD. If the site-specific analysis reveals significant exposures from all sources (i.e., health risk in terms of excess cancer risk greater than 100 in one million, acute or chronic hazards with a hazard Index greater than 10, or annual $PM_{2.5}$ exposures greater than 0.8 $\mu g/m^3$), measures shall be employed to reduce the risk to below the threshold (e.g., electrostatic filtering systems or equivalent systems and location of vents away from TAC sources).
- Future nonresidential developments projected to generate more than 100 heavy-duty truck trips daily and/or include the need for a BAAQMD permit to operate a stationary source shall include measures to protect public health to ensure they do not cause a significant health risk in terms of excess cancer risk greater than 10 in one million, acute or chronic hazards with a Hazard Index greater than 1.0, or annual $PM_{2.5}$ exposures greater than 0.3 $\mu g/m^3$.

Timing/Implementation: Prior to issuance of building permits

Enforcement/Monitoring: City of Santa Rosa Planning and Economic Development Department, Planning Division

SECTION 3: CLIMATE CHANGE SETTING

3.1 - Climate Change

Climate change is a change in the average weather of the Earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fourth Assessment Report, the IPCC predicted that the global mean temperature changes from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios.[28] The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

An individual project cannot generate enough GHG emissions to effect a discernible change in global climate. However, the proposed project participates in the potential for global climate change by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on global climate change.

3.1.1 - Consequences of Climate Change in California

In California, climate change may result in consequences such as the following:[29,30]

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.

[28] Intergovernmental Panel on Climate Change (IPCC). 2007a. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Website: www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html.

[29] California Climate Change Center (CCCC). 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: www.scc.ca.gov/webmaster/ftp/pdf/climate_change/assessing _risks.pdf. Accessed December 2013.

[30] Moser et al. 2009. Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071. Website: www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF. Accessed March 9, 2015.

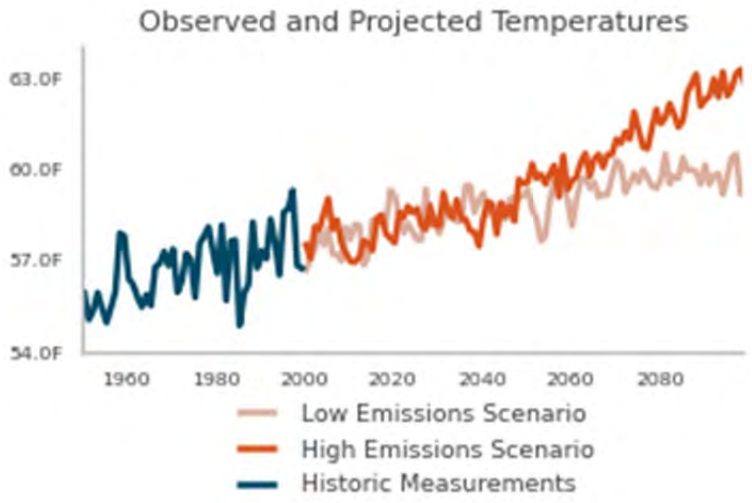
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.
- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.
- **An increase temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- **A decrease in the health and productivity of California's forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

Project Area (Burbank Avenue and Hearn Avenue in the City of Santa Rosa)

Figure 1 displays a chart of measured historical and projected annual average temperatures in the Santa Rosa area.[31] As shown in the figure, temperatures are expected to rise in the low and high GHG emissions scenarios. The results indicate that temperatures are predicted to increase by 3.0°F under the low emission scenario and 5.3°F under the high emissions scenario.

[31] CalAdapt. 2019. Local Climate Snapshots. Website: http://v1.cal-adapt.org/tools/factsheet/#. Accessed September 9, 2019.

Figure 1: Observed and Projected Temperatures for Climate Change in the Project Area



Source: CalAdapt 2019.[32]

3.2 - Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as greenhouse gases. The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide (CO_2), CH_4, nitrous oxide (N_2O), chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit GHGs. The presence of GHGs in the atmosphere affects the earth's temperature. It is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. To describe how much global warming a given type and amount of GHG may cause, the CO_2 equivalent (CO_2e) is used. The calculation of the CO_2 equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, CO_2. For example, CH_4's warming potential of 25 indicates that CH_4 has 25 times greater warming effect than CO_2 on a molecule-per-molecule basis. A CO_2 equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. As described in Table 5, the GHGs defined by Assembly Bill 32 (AB 32) (see the Climate Change Regulatory Environment section for a description) include CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. A seventh GHG, nitrogen trifluoride (NF_3), was added to Health and Safety Code Section 38505(g)(7) as a GHG of concern.

[32] CalAdapt. 2019. Local Climate Snapshots. Website: http://v1.cal-adapt.org/tools/factsheet/#. Accessed September 9, 2019.

Table 5: Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (laughing gas) is a colorless GHG. It has a lifetime of 114 years. Its global warming potential is 298.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 25.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural GHG. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Hydrofluorocarbons	Hydrofluorocarbons are a group of GHGs containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic man-made chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is man-made and used for insulation in electric power transmission equipment in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Nitrogen trifluoride	Nitrogen trifluoride (NF_3) was added to Health and Safety Code Section 38505(g)(7) as a GHG of concern. It has a high global warming potential of 17,200.	This gas is used in electronics manufacture for semiconductors and liquid crystal displays.
Sources: Compiled from a variety of sources, primarily Intergovernmental Panel on Climate Change 2007a and 2007b.		

The State of California has begun the process of addressing pollutants referred to as short-lived climate pollutants. The short-lived climate pollutants include three main components: black carbon, fluorinated gases, and methane. The ARB approved the Short-Lived Climate Pollutant Reduction Strategy in March 2017. The ARB has completed an emission inventory of these pollutants, identified research needs, identified existing and potential new control measures that offer co-benefits, and

coordinate with other State agencies and districts to develop measures.[33] Sources of black carbon are already regulated by the ARB, and air district criteria pollutant and toxic regulations that control fine particulate emissions from diesel engines and other combustion sources.[34] Additional controls on the sources of black carbon specifically for their GHG impacts beyond those required for toxic and fine particulates are not likely to be needed.

Human Health Effects of GHG Emissions

GHG emissions from development projects would not result in concentrations that would directly impact public health. However, the cumulative effects of GHG emissions on climate change have the potential to cause adverse effects to human health.

The United States Global Change Research Program, in its report, Global Climate Change Impacts in the United States, has analyzed the degree to which impacts on human health are expected to impact the United States.[35]

Potential effects of climate change on public health include:

- **Direct Temperature Effects:** Climate change may directly affect human health through increases in average temperatures, which are predicted to increase the incidence of heat waves and hot extremes.
- **Extreme Events:** Climate change may affect the frequency and severity of extreme weather events, such as hurricanes and extreme heat and floods, which can be destructive to human health and well-being.
- **Climate-Sensitive Diseases:** Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects, such as malaria, dengue fever, yellow fever, and encephalitis.
- **Air Quality:** Respiratory disorders may be exacerbated by warming-induced increases in the frequency of smog (ground-level ozone) events and particulate air pollution.[36]

Although there could be health effects resulting from changes in the climate and the consequences that can occur, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). At very high indoor concentrations (not at levels existing outside), CO, methane (CH_4), sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen.[37,38]

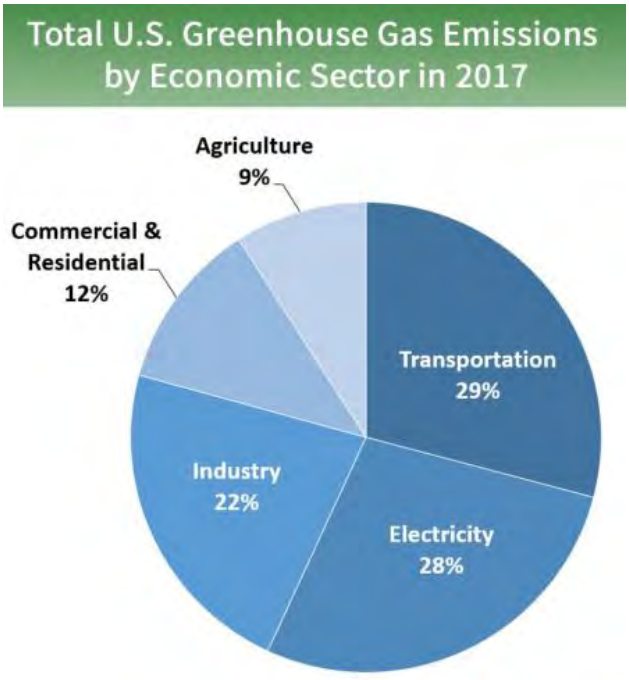
[33] California Air Resources Board (ARB). 2016. Proposed Short-Lived Climate Pollutant Reduction Strategy. Website: http://www.arb.ca.gov/cc/shortlived/shortlived.htm.
[34] California Air Resources Board (ARB). 2015. Low Carbon Fuel Standard Regulation. Website: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm. Accessed July 28, 2015.
[35] U.S. Global Change Research Program. 2009. Global Climate Change Impacts in the United States. Website: http://www.iooc.us/wp-content/uploads/2010/09/Global-Climate-Change-Impacts-in-the-United-States.pdf. Accessed September 25, 2019.
[36] United States Environmental Protection Agency (EPA). 2009. Ozone and your Health. EPA-456/F-09-001. Website: http://www.epa.gov/airnow/ozone-c.pdf.
[37] Centers for Disease Control and Prevention (CDC). 2010. Department of Health and Human Services, the National Institute for Occupational Safety and Health. Carbon Dioxide. Website: www.cdc.gov/niosh/npg/npgd0103.html. Accessed August 17, 2015.

3.2.1 - Emissions Inventories

United States GHG Inventory

Total U.S. GHG emissions were approximately 0.5 percent lower in 2017 than in 2016.[39] This decrease was largely driven by a decrease in emissions from fossil fuel combustion, which was a result of multiple factors including a continued shift from coal to natural gas and increased use of renewables in the electric power sector, and milder weather that contributed to less overall electricity use. Figure 2 presents 2017 U.S. GHG emissions by economic sector. Total U.S. GHG emissions increased by 3.6 percent from 1990 to 2017 (from 6,233.2 million metric tons [MMT] CO_2e in 1990 to 6,456.7 MMT CO_2e in 2017).

Figure 2: 2017 U.S. Greenhouse Gas Emissions by Economic Sector



Source: EPA 2019.[40]
Note: Emissions shown do not include carbon sinks such as change in land uses and forestry.

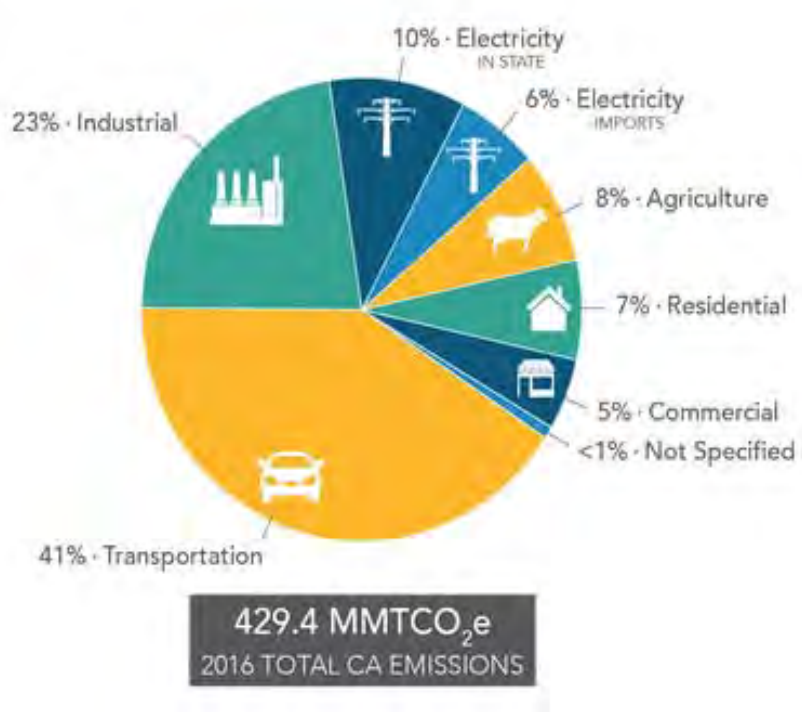
California GHG Inventory

As the second largest emitter of GHG emissions in the U.S. and the 12th to 16th largest GHG emissions emitter in the world, California contributes a large quantity (424.1 MMT CO_2e in 2017) of GHG emissions to the atmosphere.[41] Emissions of CO_2 are byproducts of fossil-fuel combustion and are

[38] Occupational Safety and Health Administration (OSHA). 2003. United States Department of Labor. Safety and Health Topics: Methane. Website: www.osha.gov/dts/chemicalsampling/data/CH_250700.html.
[39] United States Environmental Protection Agency (EPA). 2019. Inventory of U.S. Greenhouse Gas Emissions and Sinks. April 11. Website: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed September 20, 2019.
[40] United States Environmental Protection Agency (EPA). 2019. Inventory of U.S. Greenhouse Gas Emissions and Sinks. April 11. Website: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed September 20, 2019.
[41] California Climate Change Center. (CCCC). 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: www.scc.ca.gov/webmaster/ftp/pdf/climate_change/assessing_risks.pdf. Accessed June 2, 2018.

attributable in large part to human activities associated with transportation, industry/manufacturing, electricity and natural gas consumption, and agriculture. In California, the transportation sector is the largest emitter at 41 percent of GHG emissions, followed by industry/manufacturing at 24 percent of GHG emissions (Figure 3).

Figure 3: California GHG Emissions by Sector



Source: ARB 2019.[42]

3.3 - Regulatory Environment

3.3.1 - International

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention). On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

[42] California Air Resources Board (ARB). 2019. California Greenhouse Gas Emission Inventory Program. Website: https://ww2.arb.ca.gov/our-work/programs/ghg-inventory-program. Accessed September 20, 2019.

Kyoto Protocol. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at average of 5 percent against 1990 levels over the 5-year period from 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, President George W. Bush indicated that he would not submit the treaty to the United States Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. There have been several meetings held to address international climate change commitments post Kyoto, the most notable of which were held by the United Nations Climate Change Committee. The meetings are gradually gaining consensus among participants on individual climate change issues. At the Climate Summit hosted by the United Nations in September 2014, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Paris Climate Change Agreement. Parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12 in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a 4-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts, and undergo international review. The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st Session of the UNFCCC Conference of the Parties, or COP 21.

On June 1, 2017, President Trump announced the decision for the United States to withdraw from the Paris Climate Accord.[43] California remains committed to combating climate change through programs aimed to reduce GHGs.[44]

3.3.2 - Federal Regulations

Prior to the last decade, there were no concrete federal regulations of GHGs or major planning for climate change adaptation. Since then, federal activity has increased. The following are actions regarding the federal government, GHGs, and fuel efficiency.

[43] White House, The. Statement by President Trump on the Paris Climate Accord. Website: https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord. Accessed June 23, 2017.

[44] California Air Resources Board (ARB). 2017. The 2017 Climate Change Scoping Plan Update, the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. January 17. Website: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed June 1, 2018.

GHG Endangerment. *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that the EPA regulate four GHGs, including CO_2, under Section 202(a)(1) of the CAA. A decision was made on April 2, 2007, in which the Supreme Court found that GHGs are air pollutants covered by the CAA. The Court held that the Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA. These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge, the United States Supreme Court declined to review an Appeals Court ruling upholding that upheld the EPA Administrator findings.[45]

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the United States Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards would cut CO_2 emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking, establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012.[46] The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO_2 in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the United States Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, which became effective November 14, 2011. For combination tractors, the agencies proposed engine and vehicle standards that began in the 2014 model year and achieve up

[45] United States Environmental Protection Agency (EPA). 2009. Fact Sheet, Proposed Revisions to the National Ambient Air Quality Standards for Nitrogen Dioxide. July 22, 2009. Website: www.epa.gov/air/nitrogenoxides/pdfs/20090722fs.pdf.

[46] United States Environmental Protection Agency (EPA). 2012. EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017–2025 Cars and Light Trucks. Website: http://www.epa.gov/otaq/climate/documents/420f12051.pdf.

to a 20 percent reduction in CO_2 emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10 percent reduction for gasoline vehicles, and a 15 percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10 percent reduction in fuel consumption and CO_2 emissions from the 2014 to 2018 model years.

Consolidated Appropriations Act (Mandatory GHG Reporting). The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule, which became effective January 1, 2010. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010 that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for CO_2 emissions for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatt would be required to meet an output based standard of 1,000 pounds of CO_2 per megawatt-hour, based on the performance of widely used natural gas combined cycle technology.

Cap and Trade. Cap and trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. There is no federal GHG cap-and-trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap and trade.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners are California, British Columbia, Manitoba, Ontario, and Quebec. Currently only California and Quebec are participating in the cap and trade program.[47]

[47] Center for Climate and Energy Solutions (C2ES). 2015. Multi-State Climate Initiatives. Website: http://www.c2es.org/us-states-regions/regional-climate-initiatives. Accessed April 26, 2016.

3.3.3 - California

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any State in the nation. Some legislation such as the landmark AB 32 California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the by the United States District Court for the District of Columbia in 2011.[48] The standards were to be phased in during the 2009 through 2016 model years.[49]

The second phase of the implementation for the Pavley Bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation is anticipated to reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will reduce pollutants from gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The regulations will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.[50]

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs.

The ARB is the State agency charged with monitoring and regulating sources of GHGs. The ARB approved the 1990 GHG emissions level of 427 MMT CO_2e on December 6, 2007.[51] Therefore, to

[48] California Air Resources Board (ARB). 2013. Clean Car Standards—Pavley, Assembly Bill 1493. Website: http://www.arb.ca.gov/cc/ccms/ccms.htm. Accessed April 25, 2016.
[49] California Air Resources Board (ARB). 2013. Facts About the Clean Cars Program. Website: http://www.arb.ca.gov/msprog/zevprog/factsheets/advanced_clean_cars_eng.pdf. Accessed April 25, 2016.
[50] California Air Resources Board (ARB). 2011. California Air Resources Board Releases Proposed Advanced Clean Car Rules. December 7. Website: https://ww2.arb.ca.gov/news/california-air-resources-board-releases-proposed-advanced-clean-car-rules. Accessed September 26, 2019.
[51] California Air Resources Board (ARB). 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. Website: www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf.

meet the State's target, emissions generated in California in 2020 are required to be equal to or less than 427 MMT CO_2e. Emissions in 2020 in a Business as Usual (BAU) scenario were estimated to be 596 MMT CO_2e, which do not account for reductions from AB 32 regulations.[52] At that rate, a 28 percent reduction was required to achieve the 427 MMT CO_2e 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the effects of the 2008 recession and slower forecasted growth. Under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels.[53]

ARB Scoping Plan. The ARB Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32.[54] The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the proposed cap-and-trade program. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade

[52] California Air Resources Board (ARB). 2008 (includes edits made in 2009). Climate Change Scoping Plan, a framework for change. Website: www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.
[53] California Air Resources Board (ARB). 2010. Greenhouse Gas Inventory—2020 Forecast. Updated October 28, 2010. Website: www.arb.ca.gov/cc/inventory/data/forecast.htm.
[54] California Air Resources Board (ARB). 2008 (includes edits made in 2009). Climate Change Scoping Plan, a framework for change. December. Website: https://ww3.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed September 26, 2019.

emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions.[55]

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update builds upon the Initial Scoping Plan with new strategies and recommendations.[56]

SB 375—the Sustainable Communities and Climate Protection Act of 2008. Senate Bill 375 (SB 375) was signed into law on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

SB 32. The Governor signed SB 32 in September 2016, giving ARB the statutory responsibility to include the 2030 target previously contained in Executive Order B-30-15 in the 2017 Scoping Plan Update. SB 32 states that "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the State [air resources] board shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030." The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017. The major elements of the framework proposed to achieve the 2030 target are as follows:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
   - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
   - Improve freight system efficiency.
   - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.

[55] California Air Resources Board (ARB). 2008 (includes edits made in 2009). Climate Change Scoping Plan, a framework for change. December. Website: https://ww3.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed September 26, 2019.

[56] California Air Resources Board (ARB). 2014. First Update to the Climate Change Scoping Plan, building on the framework. May. Website: https://ww3.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed September 26, 2019.

5. Short-Lived Climate Pollutant Reduction Strategy
   - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
   - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - ARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. 20 percent reduction in GHG emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.[57]

SB 1368—Emission Performance Standards. In 2006, the State Legislature adopted SB 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 pounds CO_2 per megawatt-hour (MWh).

SB 1078—Renewable Electricity Standards. On September 12, 2002, Governor Gray Davis signed SB 1078, requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Governor Schwarzenegger also directed the ARB (Executive Order S-21-09) to adopt a regulation by July 31, 2010, requiring the State's load serving entities to meet a 33 percent renewable energy target by 2020. The ARB Board approved the Renewable Electricity Standard on September 23, 2010 by Resolution 10-23.

[57] California Air Resources Board (ARB). 2017. The 2017 Climate Change Scoping Plan Update, the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. January 17. Website: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed June 1, 2018.

SB 350—Clean Energy and Pollution Reduction Act of 2015. The legislature recently approved and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum Statewide were removed from the Bill due to opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce Statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.[58]

SBX 7-7—The Water Conservation Act of 2009. The legislation directs urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this Statewide goal of 20 percent decrease in demand will result in a reduction of almost 2 million acre-feet in urban water use in 2020.

SB 100—The 100 Percent Clean Energy Act of 2018. The legislation directs the CPUC, CEC, and ARB to plan for 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. This act amends Sections 399.11, 399.15, and 399.30 of, and adds Section 454.53 to, the Public Utilities Code, relating to energy.

Executive Orders Related to GHG Emissions

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the State and guide the actions of State agencies.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

[58] California Legislative Information (California Leginfo). 2015. Senate Bill 350 Clean Energy and Pollution Reduction Act of 2015. Website: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350. Accessed September 28, 2017.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

Executive Order S-01-07—Low Carbon Fuel Standard. The Governor signed Executive Order S 01-07 on January 18, 2007. The order mandates that a Statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the executive order established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The LCFS was subject to legal challenge in 2011. Ultimately, on August 8, 2013, the Fifth District Court of Appeal (California) ruled that ARB failed to comply with CEQA and the Administrative Procedure Act when adopting regulations for Low Carbon Fuel Standards. In a partially published opinion, the Court of Appeal directed that Resolution 09-31 and two executive orders of ARB approving LCFS regulations promulgated to reduce GHG emissions be set aside. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while ARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, ARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The second public hearing for the new LCFS regulation was held on September 24, 2015 and September 25, 2015, where the LCFS Regulation was adopted. The Final Rulemaking Package adopting the regulation was filed with the Office of Administrative Law (OAL) on October 2, 2015. The OAL approved the regulation on November 16, 2015.[59]

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy was adopted, which is the ". . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.[60]

[59] California Air Resources Board (ARB). 2015. Low Carbon Fuel Standard Regulation. Website: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm. Accessed July 28, 2015.

[60] California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. Website: http://www.climatechange.ca.gov/adaptation/strategy/index.html.

Executive Order B-30-15. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The executive order sets a new interim Statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of $MMCO_2e$. The executive order also requires the State's climate adaptation plan to be updated every three years and for the State to continue its climate change research program, among other provisions.

California Regulations and Building Codes

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Title 20 Appliance Efficiency Regulations. California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. Twenty-three categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.[61]

Title 24 Energy Efficiency Standards. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The newest version of Title 24 adopted by the California Energy Commission (CEC) went into effect on January 1, 2017.[62]

Title 24 California Green Building Standards Code (California Code of Regulations Title 24, Part 11 code) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect January 1, 2011. The code is updated on a regular basis, with the most recent update consisting of the 2016 California Green Building Code Standards that became effective

[61] California Energy Commission (CEC). 2014. California Code of Regulations Title 20, Division 2. March 28. Website: https://www.google.com/url?client=internal-uds-cse&cx=001779225245372747843:ctr4z8fr3aa&q=http://www.energy.ca.gov/2014publications/CEC-140-2014-002/CEC-140-2014-002.pdf&sa=U&ved=2ahUKEwip1O2Kie_kAhUUL30KHb3SDx4QFjAAegQIBhAC&usg=AOvVaw0yiPpoP2y92BDybsDdsqPJ. Accessed September 26, 3019.

[62] California Energy Commission (CEC). 2015. 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. June 2015. Website: https://ww2.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf. Accessed September 26, 2019.

January 1, 2017.[63] The 2019 Building Energy Efficiency Standards are scheduled to go into effect on January 1, 2020. One of the notable changes in the 2019 Title 24 Standards includes the solar photovoltaic systems requirement for new low-rise residential homes. Local jurisdictions are permitted to adopt more stringent requirements, as State law provides methods for local enhancements. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy, which is generally enforced by the local building official.

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881 Water Conservation Act. The Bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected for Ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed the Department of Water Resources to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015, which became effective on December 15, 2015. New development projects that include landscaped areas of 500 square feet or more are subject to the Ordinance.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)."

Section 21097 was also added to the Public Resources Code, which provided an exemption until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA. The Natural Resources Agency completed the approval process and the Amendments became effective on March 18, 2010.

The 2010 CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

California Supreme Court GHG Ruling

In a November 30, 2015 ruling, the California Supreme Court in Center for Biological Diversity v. California Department of Fish and Wildlife on the Newhall Ranch project concluded that whether the project was consistent with meeting Statewide emission reduction goals is a legally permissible criterion of significance, but the significance finding for the project was not supported by a reasoned

[63] California Energy Commission (CEC). 2016. 2016 Building Energy Efficiency Standards Frequently Asked Questions. Website: http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf. Accessed December 1, 2016.

explanation based on substantial evidence. The Court offered potential solutions on pages 25-27 of the ruling to address this issue summarized below:

Specifically, the Court advised that:

- **Substantiation of Project Reductions from BAU**. A lead agency may use a BAU comparison based on the Scoping Plan's methodology if it also substantiates the reduction a particular project must achieve to comply with statewide goals (page 25).
- **Compliance with Regulatory Programs or Performance Based Standards**. A lead agency "might assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities" (page 26).
- **Compliance with GHG Reduction Plans or Climate Action Plans**. A lead agency may utilize "geographically specific GHG emission reduction plans" such as climate action plans or GHG emission reduction plans to provide a basis for the tiering or streamlining of project-level CEQA analysis (page 26).
- **Compliance with Local Air District Thresholds**. A lead agency may rely on "existing numerical thresholds of significance for greenhouse gas emissions" adopted by, for example, local air districts (page 27).

3.3.4 - Regional

The BAAQMD is responsible for attaining and maintaining federal and State air quality standards in the San Francisco Bay Area Air Basin (Air Basin), as established by the federal CAA and the CCAA) respectively. The CAA and CCAA require that plans be developed for areas that do not meet air quality standards. The BAAQMD adopted the Bay Area Clean Air Plan: Spare the Air, Cool the Climate (Bay Area Clean Air Plan) on April 19, 2017, to provide a regional strategy to improve Bay Area air quality and meet public health goals.[64] The control strategy described in the Bay Area Clean Air Plan includes a wide range of control measures designed to reduce emissions and lower ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce GHG emissions to protect the climate.

In addition, the BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the Air Basin. The program includes GHG-reduction measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative energy sources.[65]

The BAAQMD CEQA Air Quality Guidelines also assist lead agencies in complying with CEQA requirements regarding potentially adverse impacts on air quality. The BAAQMD advises lead agencies

[64] Bay Area Air Quality Management District (BAAQMD). 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed April 24, 2018.

[65] Bay Area Air Quality Management District (BAAQMD). 2010. Climate Protection Planning Program. Website: http://www.baaqmd.gov/plans-and-climate/climate-protection/climate-protection-program. Accessed June 5, 2018.

to consider adopting a GHG reduction strategy capable of meeting AB 32 goals. This is consistent with the approach to analyzing GHG emissions described in State CEQA Guidelines Section 15183.5.

3.3.5 - Local

City of Santa Rosa Climate Action Plan

The City of Santa Rosa adopted its Climate Action Plan in June 2012.[66] The Climate Action Plan identifies policies that will achieve the State-recommended GHG target of 15 percent below 2008 levels by the year 2020 and the locally adopted reduction goal of 25 percent below 1990 levels. The Climate Action Plan provides goals, measures, and associated actions, in the topical areas of energy efficiency and conservation, renewable energy, parking and land use management, improved transport options, optimized vehicular travel, waste reduction, recycling and composting, water and wastewater, agriculture and local food, and off-road vehicles and equipment. The Climate Action Plan contains a compliance checklist for new development, which is intended to be used to determine compliance with the Climate Action Plan. The compliance checklist is not mandatory for all new development projects.

City of Santa Rosa City Code

Chapter 14-30 of the Santa Rosa City Code contains regulations pertaining to water efficient landscape design.[67] The City adopted a Water-Efficient Landscape Ordinance (Ordinance No. 3925) in 2010 that applies to new residential projects that require building or grading permit, plan check, design review or utilities certificate. The City amended the ordinance, effective December 1, 2015, to comply with the state's updated water efficiency requirements.

Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR

The proposed project site is comprised of four parcels located entirely within the City of Santa Rosa's Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects, which were approved by the City in 2016. The Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR determined that future development projects would require further CEQA review of project-level traffic impacts, and associated air emissions, prior to implementation. The EIR did not require any mitigation measures related to GHG emissions.[68]

Santa Rosa General Plan 2035

The City of Santa Rosa General Plan 2035 was adopted in 2009. The Housing Element, Transportation Element, and Open Space and Conservation Element contain the following goals and policies that are relevant to GHG emissions:[69]

[66] City of Santa Rosa. 2012. City of Santa Rosa Climate Action Plan. Website: https://srcity.org/DocumentCenter/View/10762/Climate-Action-Plan-PDF?bidId=. Accessed September 9, 2019.
[67] City of Santa Rosa. 2019. Santa Rosa City Code. Website: https://qcode.us/codes/santarosa/. Accessed September 26, 2019.
[68] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR. August. Website: https://srcity.org/428/Roseland-Area-Sebastopol-Road-Specific-P. Accessed September 16, 2019.
[69] City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035. November 3. Website: https://srcity.org/392/General-Plan. Accessed September 13, 2019.

- **H-G**: Develop energy-efficient residential units and rehabilitate existing units to reduce energy consumption
- **H-G-1**: Maximize energy efficiency in residential areas. Utilize the following techniques:
  - Implement CALGreen Tier 1 standards.
  - Fund energy conservation through the Housing Authority's rehabilitation loans.
  - Promote home improvement strategies for energy efficiency.
  - Promote energy efficiency improvements that are sensitive to the historic significance of the residential structure.
  - Consider a program that would require energy efficiency improvements when a residential structure undergoes transfer of title or major renovation.
  - Promote the Sonoma County Energy Independence Program, which funds energy and water conservation improvements.
  - Consider a program that requires energy audits and cost-effective energy upgrades for existing residential structures.
- **H-G-2**: Require, as allowed by CALGreen Tier 1 standards, energy efficiency through site planning and building design by assisting residential developers in identifying energy conservation and efficiency measures appropriate to the Santa Rosa area. Utilize the following possible techniques:
  - Use of site daylight
  - Solar orientation
  - Cool roofs and pavement
  - Window design and insulation
  - Solar water heaters
  - Solar heating of swimming pools
  - Use of sustainable practices and materials
  - Use of building materials that use fewer resources (water, electricity)
  - Energy and water use reductions
  - Use of trees for summertime shading
  - Bicycle and pedestrian connections
  - Mixed land uses to reduce vehicle trips
- **H-G-3**: Promote energy efficiency in the provision and use of water in all residential developments.
- **H-G-4**: Reduce the amount of water used, encourage the use of recycled water for landscaping where available, and require compliance with the City's Water Efficient Landscape Ordinance.
- **H-G-5**: Continue to require the use of fuel-efficient heating and cooling equipment and other appliances, in accordance with CALGreen Tier 1 standards.
- **H-G-6**: Seek opportunities to reinstate the Housing Authority's rehabilitation loan program to improve residential energy conservation and develop programs to assist low-income households and rental properties in meeting weatherization and energy conservation and preservation needs.
- **T-C**: Reduce traffic volumes and speeds in neighborhoods.

- **T-C-1**: Minimize through traffic in residential neighborhoods and avoid excessive traffic volumes greater than that dictated by street design and classification, by providing attractive regional/arterial streets to accommodate cross-town traffic.
- **T-C-2**: Encourage grid street patterns in new residential areas to disperse local neighborhood traffic, thereby limiting volumes on any one street.
- **T-C-3**: Implement traffic calming techniques on streets subject to high speed and/or cut-through traffic, in order to improve neighborhood livability. Techniques include:
  - Narrow streets;
  - On-street parking;
  - Chokers or diverters;
  - Speed bumps;
  - Rough paved crosswalks;
  - Rumble strips; and
  - Planted islands.
- **T-J**: Provide attractive and safe streets for pedestrians and bicyclists.
- **T-J-1**: Pursue implementation of walking and bicycling facilities as envisioned in the city's Bicycle and Pedestrian Master Plan.
- **T-J-2**: Provide street lighting that is attractive, functional, and appropriate to the character and scale of the neighborhood or district, and that contributes to vehicular and pedestrian safety.
- **T-K**: Develop a safe, convenient, and continuous network of pedestrian sidewalks and pathways that link neighborhoods with schools, parks, shopping areas, and employment centers.
- **T-K-4**: Require construction of attractive pedestrian walkways and areas in new residential, commercial, office, and industrial developments. Provide landscaping or other appropriate buffers between sidewalks and heavily traveled vehicular traffic lanes, as well as through and to parking lots. Include pedestrian amenities to encourage and facilitate walking.
- **OSC-I-4:** Consider water conservation measures in the review of new residential development projects.
- **OSC-I-5**: Expand the infrastructure network as possible to allow use of reclaimed water for use at residences, businesses, and city parks and facilities.
- **OSC-J-2:** Budget for clean fuels and vehicles in the city's long-range capital expenditure plans, to replace and improve the existing fleet of gasoline and diesel powered vehicles. Initiate a policy to make its fleet among the cleanest in the North Bay by:
  - Purchasing electric vehicles wherever possible, and especially for stop-and-go units such as parking meter readers.
  - Purchasing electric or hybrid electric fleet vehicles for general staff use, especially for building inspectors and other uses primarily within the city.
  - Purchasing alternative fuel vehicles, such as natural gas, as the existing diesel-powered fleet is replaced. Alternatively, purchase diesel vehicles only if they meet or exceed emission specifications for available natural gas fuel vehicles.
  - Purchasing biodiesel fuel for use by the city diesel truck fleet.
  - As possible, use lo-NO_X fuel additives, such as Purinox, in all diesel vehicles.

- **OSC-K-1**: Promote the use of site planning, solar orientation, cool roofs, and landscaping to decrease summer cooling and winter heating needs. Encourage the use of recycled content construction materials.
- **OSC-L**: Encourage the development of nontraditional and distributed sources of electrical generation.
- **OSC-M**: Reduce Greenhouse Gas Emissions
- **OSC-M-1**: Meet local, regional and state targets for reduction of greenhouse gas emissions through implementation of the Climate Action Plan.

Santa Rosa General Plan 2035 EIR

The certified EIR for the Santa Rosa General Plan 2035 was approved in June 2009.[70] The Air Quality and Climate Change section of the General Plan EIR discusses GHG emissions generated by construction and operation of development proposed by the revised General Plan 2035. The General Plan EIR does not recommend any mitigation measures that are applicable to this project beyond the 2035 policies.

[70] City of Santa Rosa. 2009. Santa Rosa General Plan 2035 EIR. June. Website: https://srcity.org/392/General-Plan. Accessed September 16, 2019.

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SECTION 4: MODELING PARAMETERS AND ASSUMPTIONS

4.1 - Model Selection and Guidance

Regional air pollutant emissions are composed of on-site and off-site construction and operational emissions generated from all facets of the project. Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors represent the emission rate of a pollutant over a given time or activity. For example, grams of NO_X per vehicle mile traveled or grams of NO_X per horsepower hour of equipment operation. The activity factor is a measure of how active a piece of equipment is and can be represented as the amount of material processed, elapsed time that a piece of equipment is in operation, horsepower of a piece of equipment used, the amount of fuel consumed in a given amount of time, or vehicle miles traveled (VMT) per day. The ARB has published emission factors for on-road mobile vehicles/trucks in the Emission Factors (EMFAC) mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. An air emissions model (or calculator) combines the emission factors and the levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) was developed in cooperation with air districts throughout the state. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with construction and operation from a variety of land uses. The most current version of CalEEMod at the time of this analysis, version 2016.3.2, uses OFFROAD2011 and EMFAC2014 emission factors. Construction and operational emissions reported in this analysis were modeled using CalEEMod, version 2016.3.2.

4.1.1 - Construction

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

Construction activities would consist of site preparation, mass grading, building construction, asphalt paving of roadways, and architectural coating of the interior and exterior of the buildings. For each construction activity, the construction equipment operating hours and numbers represent the average equipment activity over the duration of the activity. Where project-specific information was not available or unknown, default assumptions were used to complete emissions modeling. During grading activities, fugitive dust can be generated from the movement of dirt within the project area. During grading, it is expected that there will be no import or export of material and all materials will be balanced on-site, based on information provided by the project applicant. The activity for construction equipment is based on the horsepower and load factors of the equipment. In general,

the horsepower is the power of an engine—the greater the horsepower, the greater the power. The load factor is the average power of a given piece of equipment while in operation compared with its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continually operates at its maximum operating capacity. This analysis uses the CalEEMod default load factors for off-road equipment.

The construction schedule used in the analysis, which assumes the earliest possible start date, represents a "worst-case" analysis scenario since emission factors for construction equipment decrease as the analysis year increases, due to improvements in technology and compliance with more stringent regulatory requirements. Therefore, construction emissions would decrease if the construction schedule moves to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required by the CEQA Guidelines. Full construction emissions modeling parameters and assumptions are provided in Appendix A.

CalEEMod defaults for construction trips, trip lengths, and vehicle fleets were used. To make way for the proposed project, the project applicant is proposing to remove the existing single-family residence and storage structures on-site (approximately 24,771 square feet of building space) and remove the hardscape driveway (approximately 9,847 square feet). Hauling trips for the demolition phase were based on the estimated total tons of debris that would be removed associated with these existing structures; calculations are included in Appendix C.

Equipment Tiers and Emission Factors

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

4.1.2 - Operation

Operational emissions are those emissions that occur during operation of the project. The major sources are summarized below.

Motor Vehicles

Motor vehicle emissions refer to exhaust and road dust emissions from the motor vehicles that would travel to and from and within the project site. The regional emissions from the proposed project's mobile sources were estimated using the CalEEMod model. Project-specific trip rates were obtained from the proposed project's Traffic Impact Study.[71] No other changes were made to the default mobile source parameters. The traffic analysis presented weekday trips based on trip rates

[71] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.

from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Table 6 presents the forecasted daily trip generation rates from the Traffic Impact Study.

Table 6: Project-Specific Trip Generation Rates

Land Use	Quantity	Units	Weekday Trips (trips/day)[1, 2]
Proposed Multi-family Housing (Apartments)	64	du	468
Proposed Single-family Detached Housing	74	du	699

Notes:
du = dwelling units
[1] Daily trip generation rates, consistent with the traffic analysis, were assigned using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition, 2017. Rates for "Single-Family Detached Housing" (LU #210) were applied to the proposed single-family homes, the duplex units, and to the existing residence that would be removed; rates for "Multi-family Housing (Low-Rise)" (LU #220) were applied to the proposed apartment units.
[2] Net new daily trips were calculated by subtracting trips associated with the existing residence from the trip associated with the proposed housing units.
Sources:
W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.
Institute of Transportation Engineers (ITE). 2017. Trip Generation Manual, 10th Edition. October.

Other Emission Sources

Area Sources

In addition to the typical mobile- and energy-source emissions, long-term operational emissions also include area-source emissions. Area-source emissions include occasional architectural coating activities for repainting and maintenance of the proposed residential buildings. CalEEMod assumes that repainting occurs at an average rate of 10 percent of the total proposed buildings per year. Therefore, on average, it is assumed that buildings are fully repainted every 10 years.

Other area-source emissions include consumer products that involve solvents that emit VOCs during their product use. CalEEMod includes default consumer product use rates based on the building square footage.

Lastly, CalEEMod includes area-source emission calculations for landscape maintenance equipment. CalEEMod default emission factors were used for landscape maintenance equipment based on the non-residential building square footage and the number of dwelling units.

Indirect Emissions

For GHG emissions, CalEEMod contains calculations to estimate indirect GHG emissions. Indirect emissions are emissions where the location of consumption or activity is different from where the actual emissions are generated. For example, electricity would be consumed at the proposed project site; however, the emissions associated with producing that electricity are generated off-site at the power plant.

CalEEMod includes calculations for indirect GHG emissions for electricity consumption, water consumption, and solid waste disposal. For water consumption, CalEEMod calculates the embedded energy (e.g., treatment, conveyance, distribution) associated with providing each gallon of potable water to the project. For solid waste disposal, CalEEMod calculates the GHG emissions generated as solid waste generated by the project decomposes in a landfill.

For electricity-related emissions, CalEEMod contains default electricity intensity factors for various utilities throughout California. Pacific Gas and Electric (PG&E) and Sonoma Clean Power (SCP) are both electricity providers that serve Santa Rosa. For the purposes of estimating emissions, it was assumed that the proposed project would be serviced by PG&E. PG&E's 2017 power mix included 33 percent eligible renewable energy, while SCP's 2017 power content label offered a CleanStart option with 45 percent eligible renewable energy, and an EverGreen option with 100 percent eligible renewable energy.[72] For the purposes of the proposed project, the PG&E emission factor was selected to quantify electricity emissions. The project is proposed to be operational in the year 2025. As such, the CO_2 emission factor was adjusted consistent to the RPS goal of achieving utility providers achieving 33 percent mix of renewable energy in their retail sales (calculations additional supporting information for adjusted emissions factors are provided in Appendix C). The adjusted PG&E CalEEMod emission factors are shown below for the year 2025.

- Carbon dioxide: 390.65 pound per megawatt hour (lb/MWh)
- Methane: 0.029 lb/MWh
- Nitrous oxide: 0.006 lb/MWh

The factors listed below were applied in estimating project emissions for the year 2030. Calculations and additional supporting information for adjusted emissions factors are provided in Appendix C. The adjusted emission factors for PG&E are as follows:

- Carbon dioxide: 292.24 pound per megawatt hour (lb/MWh)
- Methane: 0.022 lb/MWh
- Nitrous oxide: 0.005 lb/MWh

Natural Gas

There would be emissions from the combustion of natural gas used for the proposed project (water heaters, heat, etc.). CalEEMod has two categories for natural gas consumption: Title 24 and non-Title 24. CalEEMod default natural gas consumption rates were used based on the proposed residential land use.

Existing On-site Emissions

The existing single-family residence and multiple storage structures currently occupying the site would be removed as part of the proposed project; therefore, the existing emissions were included in the analysis baseline to estimate the net increase in emissions. Assumptions used to estimate existing emissions were consistent with the trip generation estimates presented in the traffic

[72] California Energy Commission (CEC). 2019. Annual Power Content Labels for 2017. Website: https://ww2.energy.ca.gov/pcl/labels/2017_index.html. Accessed October 2, 2019.

analysis prepared for the proposed project by W-Trans.[73] Table 7 presents the forecasted average weekday trips for existing operations.

Table 7: Trip Generation Rates for Existing On-site Operations

Existing Land Use	Quantity	Units	Weekday Trips (trips/day)
Existing Single-Family Detached Housing	1	du	9

Notes:
du = dwelling units
Sources:
W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.
Institute of Transportation Engineers (ITE). 2017. Trip Generation Manual, 10th Edition. October.

[73] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. August 16.

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SECTION 5: AIR QUALITY IMPACT ANALYSIS

This section calculates the expected emissions from construction and operation of the proposed project as a necessary requisite for assessing the regulatory significance of project emissions on a regional and localized level.

5.1 - CEQA Guidelines

The CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated.

While the final determination of whether a project is significant is within the purview of the lead agency pursuant to Section 15064(b) of the CEQA Guidelines, the BAAQMD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the lead agency finds that the project has the potential to exceed these air pollution thresholds, the project should be considered to have significant air quality impacts.

5.1.1 - Thresholds of Significance

Based on Appendix G of the CEQA Guidelines, air quality impacts would occur if the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Result in other emissions (such as those leading to odors or) adversely affecting a substantial number of people.

Where available, the significance criteria established or recommended by the BAAQMD were used to make the following CEQA significance determinations. The BAAQMD has adopted standards of significance for construction and operation. The thresholds of significance are shown in Table 8. In developing thresholds of significance for air pollutants, the BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

Table 8: BAAQMD Thresholds of Significance

Pollutant	Construction Thresholds Average Daily Emissions (pounds/day)	Operational Thresholds	
		Average Daily Emissions (pounds/day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance, other Best Management Practices (BAAQMD Basic Construction Mitigation Measures)	Not Applicable	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	10 per one million	10 per one million	
Chronic or 1-hour Acute Hazard Index	1.0	1.0	
Incremental annual average $PM_{2.5}$	0.3 µg/m^3	0.3 µg/m^3	
Health Risks and Hazards for Sensitive Receptors (Cumulative from All Sources within 1,000-Foot Zone of Influence) and Cumulative Thresholds for New Sources			
Excess Cancer Risk	100 per 1 million		
Chronic Hazard Index	10.0		
Annual Average $PM_{2.5}$	0.8 µg/m^3		

Notes:
ROG = reactive organic gases, NO_X = nitrogen oxides, CO= carbon monoxide
PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 µm or less
$PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5 µm or less
µg/m^3 = micrograms per cubic meter
Source: Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed September 1, 2019.

5.2 - Impact Analysis

5.2.1 - Consistency with Air Quality Management Plan

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

Impact Analysis

The Air Basin is designated non-attainment for CAAQS for 1 hour and 8-hour ozone, 24-hour PM_{10}, annual PM_{10}, and annual fine particulate matter ($PM_{2.5}$) and the NAAQS for 8-hour ozone and $PM_{2.5}$.[74] To address regional air quality standards, the BAAQMD has adopted several air quality policies and plans, the most recent of which is the 2017 Clean Air Plan. The 2017 Clean Air Plan was adopted in April of 2017 and serves as the regional Air Quality Plan (AQP) for the Air Basin for attaining federal ambient air quality standards. The primary goals of the 2017 Clean Air Plan are to protect public health and protect the climate. The 2017 Clean Air Plan acknowledges that the BAAQMD's two stated goals of protection are closely related. As such, the 2017 Clean Air Plan identifies a wide range of control measures intended to decrease both criteria pollutants[75] and GHGs.[76]

The BAAQMD does not provide a numerical threshold of significance for project-level consistency analysis with AQPs. Therefore, the following criteria is used for determining a project's consistency with the 2017 Clean Air Plan.

- **Criterion 1:** Does the project support the primary goals of the AQP?
- **Criterion 2:** Will the project conform to the assumptions in the AQPs?
- **Criterion 3:** Does the project disrupt or hinder implementation of any AQP control measures?

Criteria 1: Support primary goals of the AQP

The primary goals of the 2017 Clean Air Plan, the current AQP to date, are to:

- Attain air quality standards;
- Reduce population exposure to unhealthy air and protecting public health in the Bay Area; and
- Reduce GHG emissions and protect the climate.

A measure for determining if the project supports the primary goals of the AQP is if the project would not result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the air quality plans. This measure is determined by comparing project-related emissions to the regional and localized thresholds identified by the BAAQMD for construction- and operational-related pollutants, which are used in the evaluation of Air Impact 2. As

[74] Bay Area Air Quality Management District (BAAQMD). 2017. Air Quality Standards and Attainment Status. Website: http://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status

[75] The EPA has established NAAQS for six of the most common air pollutants—carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen dioxide, and sulfur dioxide—known as "criteria" air pollutants (or simply "criteria pollutants").

[76] A GHG is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, GHGs are responsible for the greenhouse effect, which ultimately leads to global warming.

discussed under Air Impacts 2 and 3, the proposed project would not significantly contribute to cumulative non-attainment pollutant violations or expose sensitive receptors to substantial pollutant concentrations. Therefore, the proposed project would not result in an exceedance of BAAQMD's regional or localized thresholds of significance. As explained in Section 1.2.2, Project Description, the proposed project would implement BMPs recommended by the BAAQMD to reduce potential impacts related to fugitive dust emissions from use of construction equipment, and use construction equipment meeting Tier 4 standards to reduce impacts to sensitive receptors during project construction. The proposed project is, therefore, consistent with Criterion 1.

Criteria 2: Assumptions in AQP

A measure for determining if the project is consistent with the AQP is to determine whether a project is inconsistent with the growth assumptions incorporated into the AQP and thus, whether it would interfere with the region's ability to comply with federal and California air quality standards. The Santa Rosa Roseland Area/Sebastopol Road Specific Plan was adopted in 2016, prior to the 2017 adoption of the BAAQMD's 2017 CAP. The Roseland Area/Sebastopol Road Specific Plan designates the project site as Medium-Low Residential.[77] The Santa Rosa General Plan 2035 indicates that the Medium-Low density classification permits between 8-13 dwelling units per acre and is intended for attached single-family residential development, but single-family detached housing and multi-family development may also be permitted.[78] The Roseland Area/Sebastopol Road Specific Plan development anticipates up to 5,250 residential units, including 3,401 single-family units and 1,849 multi-family units.[79] Consistent with the transportation analysis prepared for the proposed project by W-Trans, a total of 138 units, including 72 single-family detached units and 64 multi-family units, are considered in this analysis for the purpose of assessing the proposed project's potential impacts to air quality.[80] The proposed project would develop 14.6 acres,[81] resulting in a development density of 9.5 dwelling units per acre, which is within the Medium-Low density range specified in the Santa Rosa General Plan 2035.[82] Current estimates indicate that the population of Santa Rosa was 175,625 in January of 2019. Considering an average person-per-household of 2.65 for Santa Rosa in 2019[83] and 138 single-family units, the proposed project would house approximately 366 residents.[84]

The project proposes residential development that is consistent with the types of housing and a development density that are within the requirements established in the Roseland Area/Sebastopol Road Specific Plan. Therefore, the overall development of the project site from an operational emissions and population growth standpoint would be within the growth assumptions included into the Roseland/Sebastopol Road Specific Plan. As such, the proposed project would not directly or indirectly result in substantial unplanned population growth.

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[77] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan. November. Website: https://srcity.org/428/Roseland-Area-Sebastopol-Road-Specific-P. Accessed September 13, 2019.

[78] City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035. November 3. Website: https://srcity.org/392/General-Plan. Accessed September 13, 2019.

[79] City of Santa Rosa. 2016. Roseland Area/Sebastopol Road Specific Plan. November. Website: https://srcity.org/428/Roseland-Area-Sebastopol-Road-Specific-P. Accessed September 13, 2019.

[80] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.

[81] Munselle Civil Engineering. 2019. Schellinger Burbank Avenue Subdivision Vesting Tentative Map. August 14.

[82] Based on 138 dwelling units, divided by 14.6 acres.

[83] State of California, Department of Finance. 2019. E-5 Population and Housing Estimates for Cities, Counties and the State—January 1, 2011-2019. May, http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-5/.

[84] Based on 138 dwelling units multiplied by 2.65 average persons per home, resulting in 360 residents.

The AQPs also assume that all mandatory regulations to reduce air pollution would be adhered to. Therefore, to conform to the assumptions in the AQP, the project must be consistent with all applicable measures contained in the applicable AQP. The 2017 Clean Air Plan contains 85 control measures aimed at reducing air pollutants and GHGs at the local, regional, and global levels. Along with the traditional stationary, area, mobile source, and transportation control measures, the 2017 Clean Air Plan contains a number of control measures designed to protect the climate and promote mixed use, compact development to reduce vehicle emissions and exposure to pollutants from stationary and mobile sources. The 2017 Clean Air Plan also includes an account of the implementation status of control measures identified in the 2010 Clean Air Plan.

Table 9 lists the relevant CAP policies to the project and evaluates the project's consistency with the policies. As shown below, the proposed project would be consistent with applicable measures.

Table 9: Project Consistency with Applicable Clean Air Plan Control Measures

Control Measure	Project Consistency
Stationary Control Measures	
SS29: Asphaltic Concrete	**Consistent.** Paving activities associated with the proposed project would be required to utilize asphalt that does not exceed BAAQMD emission standards.
SS36: Particulate Matter from Trackout	**Consistent.** Mud and dirt that may be tracked out onto the nearby public roads during construction activities shall be removed promptly by the contractor based on BAAQMD requirements. The proposed project would implement BMPs recommended by the BAAQMD for fugitive dust emissions during construction, as described in Section 1.2.2, Project Description.
SS37: Particulate Matter from Asphalt Operations	**Consistent.** Paving and roofing activities associated with the proposed project would be required to utilize best management practices to minimize the particulate matter created from the transport and application of road and roofing asphalt.
SS38: Fugitive Dust	**Consistent.** Material stockpiling and track out during grading activities as well as smoke and fumes from paving and roofing asphalt operations shall utilize best management practices to minimize the creation of fugitive dust.
Buildings Control Measures	
BL4: Urban Heat Island Mitigation	**Consistent.** The proposed project would provide landscaping in accordance with City standards that would serve to reduce the urban heat island effect and would include the planting of shade trees. The proposed project would also be required to include building design features in accordance with City standards.

Table 9 (cont.): Project Consistency with Applicable Clean Air Plan Control Measures

Control Measure	Project Consistency
Energy Control Measures	
EN2: Decrease Energy Use	**Consistent.** The project applicant would be required to conform to the energy efficiency requirements of the California Building Standards Code, also known as Title 24, which was adopted in order to meet an Executive order in the Green Building Initiative to improve the energy efficiency of buildings through aggressive standards. Specifically, new development must implement the requirements of the most recent Building Energy Efficiency Standards, which is the current version of Title 24. The 2016 Building Efficiency Standards are the current regulations and went into effect on January 1, 2017. Title 24 Energy Efficiency Standards are scheduled to go into effect on January 1, 2020.
Natural and Working Lands Control Measures	
NW2: Urban Tree Planting	**Consistent.** The project site contains multiple trees, particularly in the northeast corner and near the western boundary of the project site. If any tree removal is proposed, the project would be required to comply with the City's tree preservation ordinance.[1] Additionally, the proposed project would provide landscaping in accordance with the City's landscaping standards ordinance, which establishes requirements for plant selection and grouping.[2]

Source: Bay Area Air Quality Management District. 2017. Spare the Air, Cool the Climate: 2017 Clean Air Plan. April 19.
[1] City of Santa Rosa. 2019. Santa Rosa City Code, Chapter 17-24 Trees. Website: https://qcode.us/codes/santarosa/view.php?topic=17-17_24-iii-17_24_030&frames=on. Accessed September 27, 2019
[2] City of Santa Rosa. 2019. Santa Rosa City Code, Chapter 20-34 Landscaping Standards. Website: https://qcode.us/codes/santarosa/view.php?topic=17-17_24-iii-17_24_030&frames=on. Accessed September 27, 2019

In summary, the proposed project would not conflict with any applicable measures under the 2017 Clean Air Plan after the implementation of the BMPs recommended by the BAAQMD for fugitive dust emissions during construction. In addition, the overall development of the project site would be consistent with the growth assumptions incorporated into the air quality plan. Considering this information, the proposed project would be consistent with Criterion 2.

Criteria 3: Control Measures

The proposed project would not preclude extension of a transit line or bike path, propose excessive parking beyond parking requirements, or otherwise create an impediment or disruption to implementation of any AQP control measures. As shown in Table 9 above, the proposed project would incorporate several AQP control measures as project design features. Considering this

information, the proposed project would not disrupt or hinder implementation of any AQP control measures. The proposed project is therefore consistent with Criterion 3.

Summary

In summary, the proposed project would be consistent with all three criteria. Thus, the proposed project would not conflict with the 2017 Clean Air Plan. Therefore, impacts associated with conflicting with or obstructing implementation of the 2017 Clean Air Plan would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Less than significant impact.

5.2.2 - Cumulative Impacts

Impact AIR-3:	**The project would not 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 which exceed quantitative thresholds for ozone precursors).**

Impact Analysis

This impact is related to the cumulative effect of a project's regional criteria pollutant emissions. By its nature, air pollution is largely a cumulative impact resulting from emissions generated over a large geographic region. The non-attainment status of regional pollutants is a result of past and present development within the Air Basin, and this regional impact is a cumulative impact. Therefore, new development projects (such as the proposed project) within the Air Basin would contribute to this impact only on a cumulative basis. No single project would be sufficient in size, by itself, to result in non-attainment of regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects.

Potential localized and regional impacts could result in exceedances of State or federal standards for NO_X, particulate matter (PM_{10} and $PM_{2.5}$), or CO. NO_X emissions are of concern because of potential health impacts from exposure to NO_X emissions during both construction and operation and as a precursor in the formation of airborne ozone. PM_{10} and $PM_{2.5}$ are of concern during construction because of the potential to emit exhaust emissions from the operation of off-road construction equipment and fugitive dust during earth-disturbing activities (construction fugitive dust). CO emissions are of concern during project operation because operational CO hotspots are related to increases in on-road vehicle congestion.

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

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

Construction Emissions

During construction, fugitive dust would be generated from site grading and other earth-moving activities. The majority of this fugitive dust would remain localized and would be deposited near the project site. However, the potential for impacts from fugitive dust exists unless control measures are implemented to reduce the emissions from this source. Exhaust emissions would also be generated from the operation of the off-road construction equipment and construction-related vehicles.

Construction Fugitive Dust-Related PM_{10} and $PM_{2.5}$

The BAAQMD does not recommend a numerical threshold for fugitive dust particulate matter emissions. Instead, the BAAQMD bases the determination of significance for fugitive dust on a consideration of the control measures to be implemented. If all appropriate emissions control measures recommended by the BAAQMD are implemented for a project, then fugitive dust emissions during construction are not considered significant.

As explained in Section 1-Project Description, the proposed project would implement the best management practices recommended by the BAAQMD. During construction activities, air pollution control measures shall be implemented as outlined in MM 3.3.3 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR. With incorporation of this measure, short-term construction impacts associated with violating an air quality standard or contributing substantially to an existing or projected air quality violation would be less than significant.

Construction Air Pollutant Emissions: ROG, NO_X, Exhaust-Related PM_{10} and $PM_{2.5}$

CalEEMod Version 2016.3.2 was used to estimate the proposed project's construction emissions. CalEEMod provides a consistent platform for estimating construction and operational emissions from

a wide variety of land use projects and is the model recommended by the BAAQMD for estimating project emissions. Estimated construction emissions are compared with the applicable thresholds of significance established by the BAAQMD to assess ROG, NO_X, exhaust PM_{10}, and exhaust $PM_{2.5}$ construction emissions to determine significance for this criterion.

For the purpose of this analysis, construction of the proposed project was assumed to begin in May 2021 and conclude in May 2025. The anticipated construction start date and construction duration were provided by the project applicant. If the construction schedule moves to later years, construction emissions would likely decrease because of improvements in technology and more stringent regulatory requirements. For a more detailed description of the construction parameters used in estimating air pollutant emissions is included in Section 4, Modeling Parameters and Assumptions.

Average daily construction emissions are compared with the significance thresholds in Table 10.

Table 10: Construction Emissions (Unmitigated Average Daily Rate)

Parameter	Air Pollutants			
	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
2021 Construction Emissions (tons/year)	0.34	3.19	0.15	0.14
2022 Construction Emissions (tons/year)	0.63	0.91	0.04	0.04
2023 Construction Emissions (tons/year)	0.39	0.72	0.03	0.03
2024 Construction Emissions (tons/year)	0.17	0.70	0.03	0.03
2025 Construction Emissions (tons/year)	0.49	0.40	0.01	0.01
Total Emissions (tons/year)	*2.02*	*5.91*	*0.27*	*0.25*
Total Emissions (lbs/year)	4,048	11,823	538	504
Average Daily Emissions (lbs/day)[1]	7.23	21.11	0.96	0.90
Significance Threshold (lbs/day)	**54**	**54**	**82**	**54**
Exceeds Significance Threshold?	**No**	**No**	**No**	**No**

Notes:
[1] Calculated by dividing the total construction emissions (in lbs/year) by the total 1,192 working construction days for the duration of construction (2021-2025).
Calculations use unrounded totals.
lbs = pounds ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns in diameter
$PM_{2.5}$ = particulate matter 2.5 microns in diameter
Source: CalEEMod Output (Appendix A).

As shown in Table 10**,** the construction emissions from all construction activities would be below the recommended thresholds of significance; therefore, the construction of the proposed project would have less than significant impact in regards to emissions of ROG, NO_X, exhaust PM_{10}, and exhaust $PM_{2.5}$. In addition, as previously discussed, the proposed project would implement MM 3.3.3 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR for

BMPs recommended by the BAAQMD to reduce potential impacts related to fugitive dust emissions from use of the construction equipment. Therefore, project construction would have a less than significant impact.

Operational Regional Emissions

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

Operational emissions would include area, energy and mobile sources. Area sources would include emissions from architectural coatings, consumer products, and landscape equipment. Energy sources include emissions from the combustion of natural gas for water heaters and other heat sources. Mobile sources include exhaust and road dust emissions from the automobiles that would travel to and from the project site. Pollutants of concern include ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Project operations were analyzed assuming full-buildout in 2025. The major sources for existing and proposed operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ include motor vehicle traffic, use of natural gas, and the occasional repainting of buildings. The existing office building currently occupying the site would be removed as part of the proposed project; therefore, the existing emissions were included in the analysis baseline to estimate the net increase in emissions. As described in Section 4, Modeling Parameters and Assumptions, assumptions used to estimate existing and proposed emissions were consistent with the trip generation estimates presented in the traffic analysis prepared for the proposed project by W-Trans.[85] The estimated average daily net emissions are presented in Table 11, while annual net emissions from project operations are presented in Table 12. For a more detailed description of the operational parameters used in estimating air pollutant emissions, please refer to Section 4, Modeling Parameters and Assumptions.

Table 11: Average Daily Operational Emissions (Unmitigated)

Emissions Source	Pounds per Day			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Estimated Average Daily Project Emissions	6.58	8.60	5.59	1.59
Estimated Average Daily Existing Emissions	0.38	0.07	0.05	0.02
Estimated Average Daily Net Emissions	6.20	8.53	5.54	1.57
Thresholds of Significance (lbs/day)	**54**	**54**	**82**	**54**
Exceeds Significance Threshold?	**No**	**No**	**No**	**No**

Notes:
ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
Calculations use unrounded results.
Source: Appendix A.

[85] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.

Table 12: Annual Operational Emissions (Unmitigated)

Emissions Source	Tons per Year			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	0.91	0.01	0.01	0.01
Energy	0.01	0.12	0.01	0.01
Mobile (Motor Vehicles)	0.28	1.43	1.00	0.28
Estimated Annual Project Emissions	*1.20*	*1.57*	*1.02*	*0.29*
Estimated Annual Existing Emissions	0.07	0.01	0.01	0.00
Estimated Annual Net Emissions	**1.13**	**1.56**	**1.01**	**0.29**
Thresholds of Significance	**10**	**10**	**15**	**10**
Exceeds Significance Threshold?	**No**	**No**	**No**	**No**

Notes:
ROG = reactive organic gases NO_X = oxides of nitrogen
PM_{10} = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
Calculations use unrounded results.
Source: Appendix A.

As shown in Table 11 and Table 12, the proposed project would not result in operational-related criteria pollutants or precursors that would exceed the BAAQMD's thresholds of significance, indicating that ongoing project operations would not be considered to have the potential to generate a significant quantity of air pollutants. Therefore, long-term operational impacts associated with criteria pollutant and precursor emissions would be less than significant.

Operational Carbon Monoxide Hotspot

The CO emissions from traffic generated by the proposed project are a concern at the local level. Congested intersections can result in high, localized concentrations of CO that exceed the State or federal ambient air quality standards.

The BAAQMD recommends a screening analysis to determine if a project has the potential to contribute to a CO hotspot. The screening criteria uses conservative assumptions to identify when site-specific CO dispersion modeling is necessary. In other words, if a project does not exceed the screening criteria, it is highly unlikely to exceed the ambient air quality standards. The proposed project would result in a less than significant impact to air quality for local CO if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans; or

- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; or
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

No intersections impacted by the proposed project would experience traffic volumes of 44,000 vehicles per hour. According to the traffic analysis prepared for the proposed project by W-Trans, the intersection of Burbank Avenue and Sebastopol Road would experience the highest cumulative peak-hour traffic volumes among the project study intersections.[86] The intersection of Burbank Avenue and Sebastopol Road is expected to carry approximately 1,794 vehicles per hour during the PM peak-hour in the Baseline Plus Project scenario; therefore, none of the intersections near the project site would have peak-hour traffic volumes exceeding 44,000 vehicles per hour. Furthermore, the adjacent roadways are not located in an area where vertical or horizontal atmospheric mixing is substantially limited. Therefore, based on the above criteria, the proposed project would not exceed the CO screening criteria and would have a less than significant impact related to CO.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM 3.3.3 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR.

Level of Significance After Mitigation

Less than significant impact.

5.2.3 - Sensitive Receptors

Impact AIR-3:	**The project would not expose sensitive receptors to substantial pollutant concentrations.**

Impact Analysis

This impact evaluates the potential for the project's construction and operational emissions to expose sensitive receptors to substantial pollutant concentrations. A sensitive receptor is defined by the BAAQMD as the following: "facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and residential areas."[87] The project site is

[86] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.

[87] Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed August 1, 2019.

surrounded by existing urban development and is located within a residential neighborhood. Existing sensitive receptors are located within 1,000 feet of the project site in all directions. The closest existing sensitive receptors include the following:

- A single-family residence located within 40 feet north of project site;
- Single-family residences located within 75 feet west project site;
- Single-family residences located approximately 15 feet east of the project site;
- Single-family residences located approximately 30 feet south of the southernmost boundary of the project site; and
- Single-family residences located approximately 11 feet south of the northwestern portion of the project site.

The following four criteria were applied to determine the significance of project emissions to sensitive receptors:

- **Criterion 1:** Construction of the project would not result in an exceedance of the health risk significance thresholds.
- **Criterion 2:** Operation of the project would not result in an exceedance of the health risk significance thresholds.
- **Criterion 3:** The cumulative health impact would not result in an exceedance of the cumulative health risk significance thresholds.
- **Criterion 4:** The project would not locate new sensitive receptors (residents) that could be subject to existing sources of TACs at the project site.

Criterion 1: Project Construction Toxic Air Pollutants

A project-level assessment was made of the potential community risk and health risk impacts to surrounding sensitive receptors resulting from the emissions of TACs during construction. A summary of the assessment is provided below, while the detailed assessment is provided in Appendix B. As explained in Section 1-Project Description, the proposed project would implement measures during construction to reduce potential exposure of DPM and $PM_{2.5}$ emissions to sensitive receptors located near construction of the proposed project.

AIR-2 To reduce potential exposure of diesel particulate matter (DPM) and particulate matter, including dust, 2.5 micrometers or less in diameter ($PM_{2.5}$) emissions to sensitive receptors located near construction of proposed project, the proposed project would implement either of the following two measures during all phases of construction.

- Prior to the issuance of any grading or building permits (whichever occurs earliest), the project applicant and/or construction contractor shall prepare a construction operations plan that, during construction activities, requires all off-

road equipment with engines greater than 25 horsepower to meet either United States Environmental Protection Agency (EPA) or California Air Resources Board (ARB) particulate matter emissions standards for Tier 4 engines. The construction contractor shall maintain records documenting its efforts to comply with this requirement, including equipment lists. Off-road equipment descriptions and information shall include, but are not limited to, equipment type, equipment manufacturer, equipment identification number, engine model year, engine certification (Tier rating), horsepower, and engine serial number. The project applicant and/or construction contractor shall submit the construction operations plan and records of compliance to the City of Santa Rosa Planning and Economic Development Department, Planning Division.

- Alternatively, in lieu of the Tier 4 engines identified above, the construction contractor may use other measures to minimize DPM emissions to reduce the estimated cancer risk below the thresholds. Options could include the use of equipment that includes ARB-certified Level 3 diesel particulate filters, alternatively-fueled equipment (i.e., non-diesel), or use of added exhaust muffling and filtering devices. If any of these alternative measures are proposed, the project applicant and/or construction contractor shall include them in the construction operations plans that include specifications of the equipment to be used during construction. Furthermore, a signed letter by a qualified air quality specialist shall accompany the construction operations plan, which verifies that the equipment included in the plan meets the health risk standards set forth in this measure.

ARB has identified DPM as a carcinogen. Major sources of DPM include diesel-fueled off-road construction equipment, heavy-duty delivery trucks, and a portion of worker vehicles.

Emissions from construction-related automobiles, trucks, and heavy equipment are a primary concern due to the release of DPM, organic TACs from vehicles, and $PM_{2.5}$, which is a regulated air pollutant. The City of Santa Rosa does not have significance criteria for construction TAC impacts. As a result, the BAAQMD criteria for TAC impacts are used by the City. Based on the BAAQMD CEQA Guidelines (2017),[88] a project would result in a significant construction TAC or $PM_{2.5}$ impact if it exceeds any of the thresholds of significance listed below:

- An excess cancer risk level of more than 10 in one million, or a non-cancer (chronic or acute) hazard index greater than 1.0; or
- An incremental increase of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$.

[88] Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed August 1, 2019.

Health Risk Assessment: Hazards from Project Construction

The BAAQMD has developed a set of guidelines for estimating cancer risks that provide adjustment factors that emphasize the increased sensitivities and susceptibility of young children to exposures to TACs.[89] These adjustment factors include age-sensitivity weighting factors, age-specific daily breathing rates, and age-specific time-at-home factors. The recommended method for the estimation of cancer risk is shown in Appendix B.

Community Risk Assessment: Estimation of Toxic Air Contaminants

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

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

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

Estimation of Construction DPM Emissions

Construction DPM emissions (represented as $PM_{2.5}$ exhaust) were estimated using CalEEMod version 2016.3.2. For a more detailed description of the construction parameters used in estimating air pollutant emissions is included in Section 4, Modeling Parameters and Assumptions.

Estimation of Construction DPM Emissions

Based on the analysis presented in this section, emissions were estimated for the unmitigated scenario and a scenario with clean engines (Tier 4 mitigated). Equipment tiers are explained in Section 4, Modeling Parameters and Assumptions.

Estimation of Health Risks and Hazards from Project Construction

Table 13 describes the maximally exposed individual (MEI).

[89] Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed August 1, 2019.

Table 13: Maximally Exposed Sensitive Receptor in Each Scenario Analyzed

Phase	Maximally Exposed Individual	Distance from Closest On-site Construction
Full Build-out Assessing Off-site Sensitive Receptors Only	An existing residence located approximately 40 feet west of Lot 48 and 30 feet north of the western portion of Public Road 3 (see Exhibit 3 for the project site plan).	30 feet
Source: Appendix A.		

The maximally exposed individual (MEI) was found at an existing residence located approximately 30 feet from the project site, west of Lot 48 (see Exhibit 3 for the project site plan). Table 14 presents a summary of the project's construction cancer risk, chronic non-cancer hazard, and $PM_{2.5}$ concentration impacts at the MEI prior to the application of any equipment mitigation. As discussed in Air Impact 2, MM 3.3.3 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR would be required to reduce fugitive dust emissions during construction. Annual $PM_{2.5}$ emissions were estimated assuming compliance with MM 3.3.3 of the 2016 EIR. It should be noted that inclusion of MM 3.3.3 only reduces $PM_{2.5}$ total and fugitive dust, but not $PM_{2.5}$ exhaust.

Table 14: Estimated Health Risks and Hazards during Project Construction—Prior to Application of Tier 4 Construction Equipment

Scenario[1]	Cancer Risk (risk per million)	Chronic Non-Cancer Hazard Index[2]	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Risks and Hazards at the MEI: Infant	93.9	0.0383	0.253
Risks and Hazards at the MEI: Child	22.6	0.0383	0.253
Risks and Hazards at the MEI: Adult	1.6	0.0383	0.253
Maximum Risks and Hazards from Any Scenario	**93.9**	**0.0383**	**0.253**
BAAQMD Thresholds of Significance	**10**	**1**	**0.30**
Exceeds Individual Source Threshold?	**Yes**	**No**	**No**

Notes:
[1] The MEI for each scenario is defined in Table 13.
[2] Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 $\mu g/m^3$.
MEI = maximally exposed individual
Source: Appendix B.

As shown above in Table 14, the proposed project's construction DPM emissions would not exceed the applicable thresholds of significance at the MEI for the chronic non-cancer hazard index or for the

annual $PM_{2.5}$ concentration. However, without implementation of any mitigation measures, the proposed project's construction-related cancer risk would exceed BAAQMD's threshold of significance.

Table 15 presents a summary of the proposed project's construction cancer risk, chronic non-cancer hazard, and $PM_{2.5}$ concentration impacts at the MEI after implementation of MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR.

Table 15: Estimated Health Risks and Hazards during Project Construction—Tier 4 Equipment (Mitigated)

Scenario[1]	Cancer Risk (risk per million)	Chronic Non-Cancer Hazard Index[2]	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Risks and Hazards at the MEI: Infant	6.9	0.003	0.078
Risks and Hazards at the MEI: Child	1.7	0.003	0.078
Risks and Hazards at the MEI: Adult	0.12	0.003	0.078
Maximum Risks and Hazards from Any Scenario	**6.9**	**0.003**	**0.078**
BAAQMD Thresholds of Significance	**10**	**1**	**0.30**
Exceeds Individual Source Threshold?	**No**	**No**	**No**

Notes:
[1] The MEI for each scenario is defined in Table 13.
[2] Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 $\mu g/m^3$.
MEI = maximally exposed individual
Source: Appendix B.

As noted in Table 15, the proposed project's construction emissions would not exceed any of the BAAQMD's significance thresholds after implementation of MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR; therefore, project-related emissions would not result in significant health impacts to nearby sensitive receptors during construction.

Criterion 2: Project-Specific Operational Toxic Air Pollutants

The proposed project is residential in nature and would not generate substantial on-site sources of TACs during operation. As described in the project-specific traffic impact analysis, the proposed project is expected to generate 1,167 weekday vehicle trips after incorporation of reductions for location-based reductions.[90] The existing development is estimated to generate nine average weekday trips; therefore, the proposed project is estimated to increase average daily trips generated by the land use occupying the project site by 1,158 weekday vehicle trips. The proposed project would primarily generate trips for residents traveling to and from the project site, which would primarily be generated by passenger vehicles. Because nearly all passenger vehicles are gasoline-

[90] W-Trans. 2019. Traffic Impact Study for the Burbank Avenue Subdivision Project. November 6.

combusted, the proposed project would not generate a significant amount of DPM emissions during operation. Furthermore, these emissions would be dispersed throughout the local roadway network and would not be solely be generated at the project site. Therefore, the proposed project would not result in significant health impacts to nearby sensitive receptors during operation.

Criterion 3: Cumulative Health Risk Assessment

The BAAQMD recommends assessing the potential cumulative impacts from sources of TACs within 1,000 feet of a project. As a result, a cumulative Health Risk Assessment (HRA) was performed that examined the cumulative impacts of the project's construction emissions and sources of TAC emissions within 1,000 feet of the project. The MEI was determined to be an existing residence located approximately 30 feet from the project site, west of Lot 48.

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

- **Surface Street Screening Tables.** The BAAQMD pre-calculated potential cancer risks and $PM_{2.5}$ concentration increases for each county within their jurisdiction for roadways that meet BAAQMD "major roadway" criteria of 10,000 vehicles or 1,000 trucks per day. Risks are assessed by roadway volume, roadway direction, and distance to sensitive receptors. There are no major roadways within 1,000 feet of the MEI.
- **Freeway Screening Analysis Tool**. The BAAQMD prepared a Google Earth file that contains pre-estimated cancer risk, hazard index, and $PM_{2.5}$ concentration increases for highways within the Bay Area. Risks are provided by roadway link and are estimated based on direction and distance to the sensitive receptor. There are no freeways located within 1,000 feet of the MEI.
- **Stationary Source Risk and Hazard Screening Tool**. The BAAQMD prepared a Google Earth file that contains the locations of all stationary sources within the Bay Area that have BAAQMD permits. For each emissions source, the BAAQMD provides conservative estimates of cancer risk, non-cancer hazards, and $PM_{2.5}$ concentrations. There are no existing stationary sources located within 1,000 feet of the MEI.

The cumulative health risk results are summarized during project construction in Table 16.

Table 16: Summary of the Cumulative Health Impacts at the MEI during Construction

Source	Source Name/Source Type	Distance from MEI[1] (feet)	Distance from Project Site (feet)	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Project						
Construction After Tier 4 Equipment	Diesel Construction Equipment	30	0	6.9	0.003	0.078

Table 16 (cont.): Summary of the Cumulative Health Impacts at the MEI during Construction

Source	Source Name/Source Type	Distance from MEI[1] (feet)	Distance from Project Site (feet)	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Cumulative Health Risks						
Cumulative Total with Unmitigated Project Construction				**6.9**	**0.003**	**0.078**
BAAQMD Cumulative Thresholds of Significance				**100**	**10**	**0.8**
Threshold Exceedance?				**No**	**No**	**No**

Notes:
[1] The MEI was found at an existing residence located approximately 30 feet from the project site, west of Lot 48.
[2] Assumes emissions remain constant with time.
MEI = maximally exposed individual
N/A = no data available
Source: Appendix B and Appendix C.

As noted in Table 16, the cumulative impacts from project construction and existing sources of TACs would be less than the BAAQMD cumulative thresholds of significance. Thus, the cumulative health risk impacts from project construction would be less than significant.

Criterion 4: Project as a Receptor

The proposed project would locate new sensitive receptors (residents) that could be subject to existing sources of TACs at the project site. However, the California Supreme Court concluded in *California Building Industry Association v. BAAQMD* that agencies generally subject to CEQA are not required to analyze the impact of existing environmental conditions on a project's future users or residents. Although impacts from existing sources of TAC emissions on sensitive receptors on the project site are not subject to CEQA, the City of Santa Rosa requires the completion of air quality modeling for sensitive land uses such as new residential developments that are located near sources of pollution such as freeways and industrial uses.

To determine the impact of existing, nearby TAC sources on the proposed project's residents, the BAAQMD screening analysis was applied at the project site to evaluate existing TACs that could adversely affect individuals within the planned project. The three BAAQMD-provided tools for use in screening potential sources of TACs are assessed below:

- **Surface Street Screening Tables.** The BAAQMD pre-calculated potential cancer risks and $PM_{2.5}$ concentration increases for each county within their jurisdiction for roadways that meet BAAQMD "major roadway" criteria of 10,000 vehicles or 1,000 trucks per day. There are no major roadways within 1,000 feet of the project site.
- **Freeway Screening Analysis Tool**. The BAAQMD prepared a Google Earth file that contains pre-estimated cancer risk, hazard index, and $PM_{2.5}$ concentration increases for highways within the

Bay Area. Risks are provided by roadway link and are estimated based on direction and distance to the sensitive receptor. There are no freeways located within 1,000 feet of the project site.

- **Stationary Source Risk and Hazard Screening Tool**. The BAAQMD prepared a Google Earth file that contains the locations of all stationary sources within the Bay Area that have BAAQMD permits. For each emissions source, the BAAQMD provides conservative estimates of cancer risk, non-cancer hazards, and $PM_{2.5}$ concentrations. There are no existing stationary sources located within 1,000 feet of the project site.

Considering the information presented above, the cumulative health impacts to the future on-site residents from existing TAC emission sources located within 1,000 feet of the proposed project would not exceed the BAAQMD's cumulative health significance thresholds.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM 3.3.3 and MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects EIR.

Level of Significance After Mitigation

Less than significant impact.

5.2.4 - Objectionable Odors

Impact AIR-4:	**The project would not create objectionable odors affecting a substantial number of people.**

Impact Analysis

As stated in the BAAQMD 2017 Air Quality Guidelines, odors are generally regarded as an annoyance rather than a health hazard and the ability to detect odors varies considerably among the populations and overall is subjective. The BAAQMD does not have a recommended odor threshold for construction activities. However, the BAAQMD recommends operational screening criteria that are based on distance between types of sources known to generate odor and the receptor.[91] For projects within the screening distances, the BAAQMD has the following threshold for project operations:

> An odor source with five or more confirmed complaints per year averaged over 3 years is considered to have a significant impact on receptors within the screening distance shown in Table 3-3 [of the BAAQMD's CEQA Guidelines].

[91] Bay Area Air Quality Management District (BAAQMD). 2017. Air Quality Standards and Attainment Status. Website: http://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status

Two circumstances have the potential to cause odor impacts:

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

Project Construction

Diesel exhaust and ROGs would be emitted during construction of the proposed project, which are objectionable to some; however, emissions would disperse rapidly from the project site and therefore would not create objectionable odors affecting a substantial number of people. As such, construction odor impacts would be less than significant.

Project Operation

Project as an Odor Generator

Land uses typically considered associated with odors include wastewater treatment facilities, waste-disposal facilities, or agricultural operations.

The proposed project is a residential development project and is not expected to produce any offensive odors that would result in odor complaints. During operation of the proposed project, odors would primarily consist of passenger vehicles traveling to and from the site. Regular trash services would be provided by the City to avoid accumulation of refuse and potential odor sources near residents. These occurrences would not produce objectionable odors affecting a substantial number of people; therefore, operational impacts associated with the proposed project's potential to create odors would be less than significant.

Project as a Receptor

The proposed project consists of a residential development and would have the potential to place sensitive receptors (residents) near existing or planned sources of odors. The project site is not located within the vicinity of agricultural operations (e.g., dairies, feedlots, etc.), wastewater treatment plants, or refineries; however, there is a landfill, asphalt plant, chemical manufacturer, and several auto body facilities that would support painting/coating operations within the screening distances shown in the BAAQMD's CEQA Guidelines. Public records requests were filed with the BAAQMD to obtain the most recent 3-year odor compliant history for the potential odor generators within the vicinity of the project site; the information obtained from the public record requests is summarized in Table 17.

Table 17: Summary of Odor Complaint Records

Name of Facility	Location	Land Use/Type of Operation	Number of Complaints Over Most Recent 3-year Period[1]	Average Number of Confirmed Complaints per Year	Distance From the Project Site
BoDean Company Inc.	1060 North Dutton Avenue, Santa Rosa, CA 95401	Asphalt Plant	31 unconfirmed 3 confirmed 3 pending	3	1.56 miles north
Sonoma County Waste Disposal	3133 Stony Point Road, Santa Rosa, CA 94507	Sewage Disposal Service	0	0	1.32 miles south
Cutting Edge Solutions	1572 Hampton Way A, Santa Rosa, CA 95407	Chemical Manufacturing	0	0	0.46-mile north
A Perfect Experience Auto Detail	90 Timothy Road Suite G, Santa Rosa, CA 95407	Painting/Coating Operations	0	0	0.76-mile northeast
Final Touch Auto Detailing	1701B Santa Rosa Avenue, Santa Rosa, CA 95404	Painting/Coating Operations	0	0	0.93-mile east
A-1 Ultimate Detail	2549 Santa Rosa Avenue, Santa Rosa, CA 95407	Painting/Coating Operations	0	0	0.99-mile southeast
Guanella Auto Body	2789 Sebastopol Road, Santa Rosa, CA 95407	Painting/Coating Operations	0	0	0.92-mile west
Astorga's Auto Repair	1572 Hampton Way No. D2, Santa Rosa, CA 95407	Painting/Coating Operations	0	0	0.53-mile north
Maaco Collision Repair and Auto Painting	112 Commercial Court Santa Rosa, CA 95407	Painting/Coating Operations	0	0	0.92-mile southeast
Lopez Auto Repair, Auto Parts and Much More	12 West 3rd Street No. B, Santa Rosa, CA 95401	Painting/Coating Operations	0	0	0.96-mile northeast

Notes:
[1] August 2016–September 2019.

Based on the responses from the BAAQMD, there are no land uses within the screening distances shown in Table 3-3 of the BAAQMD's CEQA Guidelines that have received five or more confirmed complaints per year for any recent 3-year period. The BoDean Company Inc. asphalt plant has a total of 37 complaints, but of these only three have been confirmed. For all facilities outlined in Table 17, there are existing residential uses located closer to each facility than the proposed project. Considering all of the information, the uses in the project vicinity would not cause substantial odor impacts to the project. The proposed project would not place odor sensitive receptors near an existing or planned source of odor affecting a substantial number of people. Therefore, operational odor impacts in terms of the project site as an odor sensitive receptor would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Less than significant impact.

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SECTION 6: GREENHOUSE GAS EMISSIONS IMPACT ANALYSIS

6.1 - CEQA Guidelines

CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on GHGs, the type, level, and impact of emissions generated by the project must be evaluated.

The following GHG significance thresholds are contained in Appendix G of the CEQA Guidelines, which were amendments adopted into the Guidelines on March 18, 2010, pursuant to SB 97. A significant impact would occur if the project would:

(a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

(b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

6.1.1 - Thresholds of Significance for this Project

The BAAQMD provides multiple options in its 2017 CEQA Guidelines for analysis of GHG emissions generated from operations. At the time of this analysis, the BAAQMD has not yet provided a construction-related GHG generation threshold, but it does recommend that construction-generated GHGs be quantified and disclosed.

The BAAQMD's project-level significance threshold for operational GHG generation was deemed appropriate to use when determining the proposed project's potential GHG impacts. The thresholds suggested by the BAAQMD are as follows:

- Compliance with a qualified GHG Reduction Strategy, or
- 1,100 MT CO_2e per year, or
- 4.6 MT CO_2e per service population (employees plus residents) per year.

It should be noted that the BAAQMD's thresholds of significance were developed based on meeting the 2020 GHG targets set forth in the AB 32 Scoping Plan.

The City of Santa Rosa's GHG Reduction Strategy provides clearance for project-related GHG emissions through 2020; however, as this project is proposed to be built post-2020, additional analysis was completed. The criteria used to determine significance is discussed under each GHG impact section below.

6.2 - Impact Analysis

6.2.1 - Greenhouse Gas Inventory

Impact GHG-1: **The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.**

Impact Analysis

Both construction and operational activities have the potential to generate GHG emissions. The proposed project would generate GHG emissions during temporary (short-term) construction activities such as site grading, use of construction equipment, movement of on-site heavy-duty construction vehicles, hauling of materials to and from the project site, asphalt paving, and construction worker motor vehicle trips.

Long-term, operational GHG emissions would result from project-related vehicular traffic, on-site combustion of natural gas, operation of any landscaping equipment, off-site generation of electrical power over the life of the proposed project, the energy required to convey water to and wastewater from the project site, the emissions associated with the hauling and disposal of solid waste from the project site, and any fugitive refrigerants from air conditioning or refrigerators.

The 2017 BAAQMD Thresholds contain the following for GHGs:

> For land use development projects (including residential, commercial, industrial, and public land uses and facilities), the threshold is compliance with a qualified GHG Reduction Strategy; or annual emissions less than 1,100 metric tons per year of carbon dioxide equivalent (CO_2e); or 4.6 metric tons CO_2e/service population/year (residents + employees).

It should be noted that the BAAQMD's thresholds of significance was established based on meeting the 2020 GHG targets set forth in the AB 32 Scoping Plan. The project's estimated total net annual project emissions, including operational emissions and amortized construction emissions were compared with the efficiency threshold of 4.6 MT CO_2e/service population/year to determine significance.

Project Construction

The proposed project would emit GHG emissions during construction from the off-road equipment, worker vehicles, and any hauling that may occur. Detailed construction assumptions are included in Section 4, Modeling Parameters and Assumptions. The BAAQMD does not currently provide a construction-related GHG threshold, but recommends that construction-related GHGs be quantified and disclosed. Total GHG emissions generated during all phases of construction were combined and are presented in Table 18. Consistent with the transportation analysis prepared for the proposed

project by W-Trans, the analysis summarized in this section assumes construction of 62 single-family detached residences, 64 apartments, and 12 single-family duplex units.[92]

Table 18: Construction Greenhouse Gas Emissions

Construction Phases	Total Emissions (MT CO_2e/year)
2021 Construction Emissions	467
2022 Construction Emissions	163
2023 Construction Emissions	149
2024 Construction Emissions	156
2025 Construction Emissions	101
Total Construction Emissions	**1,036**
Construction Emissions Amortized Over the Life of the Project (30 years)	**35**

Notes:
MT CO_2e = metric tons of carbon dioxide equivalent
Calculations use unrounded numbers.
[1] Construction GHG emissions are amortized over the 30-year lifetime of the proposed project, which is the average lifetime of a residential project.
Source: CalEEMod Output (see Appendix A).

As shown in Table 18, construction of the proposed project is estimated to generate approximately 1,036 MT CO_2e over the entire project construction duration. As discussed above, neither the City of Santa Rosa nor the BAAQMD have an adopted threshold of significance for construction-related GHG emissions. Because construction would be temporary and would not result in a permanent increase in emissions, the proposed project would not interfere with the implementation of AB 32 or SB 32. However, in the absence of a construction emission threshold and to evaluate all project-related GHG emissions, the total construction emissions were amortized over the life of the development (30 years). The amortized construction emissions were added to the annual operational emissions to determine the total emissions of the project and compare against the BAAQMD's threshold of significance, as described below.

Project Operation

Operational or long-term emissions occur over the lifetime of the project. The major sources for operational GHG emissions include:

- **Motor Vehicles:** These emissions refer to GHG emissions contained in the exhaust from the cars and trucks that would travel to and from the project site. Vehicle trips associated with project operations would primarily include resident and visitor trips to and from the proposed residential buildings. Trip generation rates used in estimating mobile-source emissions were

[92] W-Trans. 2019. Traffic Impact Study Assumptions for the Burbank Avenue Subdivision Project. November 6.

consistent with those presented in the traffic analysis prepared for the proposed project by W-Trans.[93]

- **Natural Gas:** These emissions refer to the GHG emissions that occur when natural gas is combusted on the project site for heating water, space heating, dryers, stoves, or other uses.
- **Indirect Electricity:** These emissions refer to those generated by off-site power plants to supply electricity required for the project. PG&E and SCP are both electricity providers that serve Santa Rosa. The proposed project would receive electricity through PG&E or SCP, and natural gas through PG&E. GHG emissions from energy consumption were calculated using PG&E's energy intensity factors for CO_2, N_2O, and CH_4, as noted in Section 4, Modeling Parameters and Assumptions.
- **Water Transport:** These emissions refer to those generated by the electricity required to transport and treat the water to be used on the project site.
- **Waste:** These emissions refer to the GHG emissions produced by decomposing waste generated by the project.

A more detailed description of the assumptions used to estimate project-related GHG emissions is included in Section 4.1, Model Selection and Guidance. Detailed modeling results are provided in Appendix A. Operational GHG emissions by source are shown in Table 19. The analysis includes the proposed project's annual operational emissions combined with the amortized construction emissions to estimate total project-related annual emissions.

In total, long-term operations of the proposed project would generate approximately 1,421 MT CO_2e per year in the 2025 operational year, and 1,266 MT CO_2e in the 2030 operational year. After the reduction of existing emissions, the project's net operational GHG emissions are estimated to be approximately 1,409 MT CO_2e per year in 2025 and 1,255 MT CO_2e in 2030. Considering an average person per household of 2.65 for Santa Rosa in 2019, and 138 households for the proposed project, it is estimated that the proposed project would accommodate approximately 366 residents.[94] Therefore, the proposed project will have a total service population (i.e., a project's total residents plus employees) of 366. As described in Section 4.1, Model Selection and Guidance, assumptions used to estimate existing on-site emissions were consistent with those presented in the traffic analysis prepared for the proposed project by W-Trans.

The estimated total net annual project emissions, including operational emissions and amortized construction emissions, were compared with the efficiency threshold of 4.6 MT CO_2e/service population/year to determine significance.

[93] W-Trans. 2019. Traffic Impact Study Assumptions for the Burbank Avenue Subdivision Project. November 6.
[94] State of California, Department of Finance. 2019. E-5 Population and Housing Estimates for Cities, Counties and the State—January 1, 2011-2019. May. Website: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-5/. Accessed September 27, 2019.

Table 19: Operational Greenhouse Gas Emissions

Emission Source	Year 2025 Total Emissions (MT CO_2e per year)	Year 2030 Total Emissions (MT CO_2e per year)
Area	5	5
Energy	286	249
Mobile (Vehicles)	1,023	908
Waste	52	52
Water	20	17
Amortized Construction Emissions	35	35
Total Project Emissions	1,421	1,266
Existing Emissions	12	11
Annual Net Project Emissions	**1,409**	**1,255**
Service Population (Residents + Employees)	**366**	**366**
Project Emission Generation (MT CO_2e/service population/year)	**3.8**	**3.4**
Applicable BAAQMD Threshold (MT CO_2e/service population/year)	**4.6**	**4.6**
Does project exceed threshold?	**No**	**No**

Notes:
MT CO_2e = metric tons of carbon dioxide equivalent.
Source of Emissions: CalEEMod Output (Appendix A).

As shown in Table 19, the proposed project's combined long-term net operational emissions and amortized construction emissions would not exceed the BAAQMD recommended threshold of 4.6 MT CO_2e/service population/year for GHG emissions in either year analyzed. It should be noted that the proposed project's combined net operational emissions and amortized construction emissions would exceed the BAAQMD's recommended threshold of 1,000 CO_2e per year in both 2025 and 2030. As stated before, the estimated total net annual project emissions were compared with the efficiency threshold of 4.6 MT CO_2e/service population/year to determine significance. Considering a service population for 138 residential units and emissions for 138 residential units, the proposed project's combined long-term operational emissions and amortized construction emissions would not exceed the threshold of 4.6 MT CO_2e/service population/year. Considering this information, the proposed project's generation of GHG emissions would be less than at least of BAAQMD's recommended thresholds of significance for GHG emissions. Therefore, the proposed project's generation of GHG emissions would not result in a significant impact on the environment.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Less than significant impact.

6.2.2 - Greenhouse Gas Reduction Plans

Impact GHG-2: **The project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases.**

Impact Analysis

Significance for this impact is determined by project compliance with the City of Santa Rosa Climate Action Plan (Climate Action Plan) and the ARB adopted 2017 Climate Change Scoping Plan Update. The Climate Action Plan contains a compliance checklist for new development, which is used to determine compliance with the Climate Action Plan.[95] Project compliance with Santa Rosa Climate Action Plan policies and requirements are shown in Table 20. As shown in the table, the proposed project would comply with all applicable requirements.

The City of Santa Rosa adopted its Climate Action Plan in June 2012.[96] The Climate Action Plan identifies policies that will achieve the State-recommended GHG emissions reduction target of 15 percent below 2008 levels by the year 2020 and the locally adopted reduction goals of 25 percent below 1990 levels by 2015. The Climate Action Plan provides goals, measures, and associated actions in the topical areas of energy efficiency and conservation, renewable energy, parking and land use management, improved transport options, optimized vehicular travel, waste reduction, recycling and composting, water and wastewater, agriculture and local food, and off-road vehicles and equipment.

Table 20 presents the applicable Climate Action Plan measures and actions along with the proposed project's consistency with those measures.

[95] City of Santa Rosa. 2012. City of Santa Rosa Climate Action Plan. Website: https://srcity.org/DocumentCenter/View/10762. Accessed: September 9, 2019.
[96] City of Santa Rosa. 2012. City of Santa Rosa Climate Action Plan. Website: https://srcity.org/DocumentCenter/View/10762. Accessed: September 9, 2019.

Table 20: Consistency with the Santa Rosa Climate Action Plan

Measure	Action Item	Project Compliance
Energy Efficiency in Existing Buildings: Facilitate energy efficiency upgrades and retrofits in existing commercial, residential, and industrial buildings by connecting residents and businesses with technical and financial assistance.	Connect businesses and residents with voluntary programs that provide free or low-cost energy efficiency audits and financing assistance for energy efficient appliances.	**Complies.** The proposed project is a new development project, and therefore the voluntary programs that provide free or low-cost energy efficiency audits and financing assistance for energy efficient appliances in existing buildings would not be applicable. However, the proposed project would comply with the latest energy efficiency standards and incorporate applicable energy efficiency features designed to reduce project energy consumption.[1]
	Work with the Sonoma County Energy Independence Program to offer low-interest financing and technical assistance to property owners for energy efficiency retrofits.	**Not applicable.** The proposed project is a new development project and would not include retrofits.
Smart Meter Utilization: Encourage existing development and require new development to utilize PG&E's Smart Meter system to facilitate energy and cost savings.	Require new construction and major remodels to install real-time energy monitors that allow building users to track their current energy use.	**Complies.** The proposed project would receive electricity through either PG&E or SCP. The proposed project would built to comply with all regulations.
Cool Roofs and Pavements: Require new sidewalks, crosswalks, and parking lots to be made of cool paving materials with a high solar reflectivity.	Adopt an ordinance that requires and specifies cool paving materials for new parking lots, sidewalks, roofs, and crosswalks and integrates Low Impact Development guidelines for new construction and Capital Improvement Projects.	**Complies.** The proposed project would be required to construct paved areas in accordance with Santa Rosa General Plan 2035 Policy H-G-2.[2]
	Ensure the cool roof and paving ordinance includes cool roof specifications which allow for green or living roofs and address energy installations on historic structures consistent with the Secretary of Interior's Rehabilitation Standards. Allow darker-color roofs when they meet cool roof standards.	**Complies.** The proposed project would comply with Title 24, which requires new buildings to be made of cool paving materials and be "solar ready."[1] Title 2019 24 Energy Efficiency Standards are scheduled to go into effect on January 1, 2020. The 2019 Title 24 Standards also require solar panels to be included in all new single-family residential developments.

Table 20 (cont.): Consistency with the Santa Rosa Climate Action Plan

Measure	Action Item	Project Compliance
Tree Planting and Urban Forestry: Plant and maintain trees on private property, streets, and open space areas.	Require new development to supply an adequate number of street trees and private trees.	**Complies.** The project site contains multiple trees, particularly in the northeast corner and near the western boundary of the project site. If any tree removal is proposed, the proposed project would be required to comply with the City's tree preservation ordinance.[3]
Energy-Efficient Appliances: Facilitate the efficient use of energy for appliances in residential, commercial, and industrial buildings.	Seek funding sources to develop a rebate program for residents and businesses to exchange inefficient appliances with Energy Star-certified models.	**Complies.** Implementation of the proposed project would not preclude future residents from exchanging any inefficient appliances with Energy Star verified models. Moreover, all proposed project appliances that would be installed would meet the latest Title 24 efficiency requirements.[1]
Appliance Electrification: Encourage residents and businesses to switch natural-gas-powered appliances to electric power, where appropriate.	Utilize the energy-efficient appliance rebate program to facilitate the replacement of natural gas equipment with electric-powered equipment.	**Complies.** Implementation of the proposed project would not preclude future residents from exchanging any inefficient appliances with Energy Star verified models. Moreover, all proposed project appliances that would be installed would meet the latest Title 24 efficiency requirements.[1]
	Identify opportunities to implement additional programs that will switch appliances from natural gas to electricity.	**Not applicable.** The proposed project is a new development.
Water Conservation: Continue to require and incentivize water conservation.	Require new development to reduce potable water use in accordance with the Tier 1 standards of CALGreen.	**Complies.** The proposed project would implement required green building strategies to comply with Tier 1 CALGreen standards. The proposed project includes sustainability design features that support the Green Building Strategy.[1]

Table 20 (cont.): Consistency with the Santa Rosa Climate Action Plan

Measure	Action Item	Project Compliance
	Continue and expand water conservation efforts including water-efficient landscaping, rainwater harvesting, and high-efficiency appliance and fixture installations.	**Complies.** The proposed project would conform to the City's Water Efficient Landscape Ordinance (WELO)[4] and the California Green Building Standards Code.[1]
	Replace water meters in Santa Rosa with meters that allow residents and businesses to track real-time water use through the City's online web application.	**Complies.** The proposed project would include water meters in accordance with City standards.
	Encourage existing development and require new development to utilize smart water meters to facilitate water and cost savings.	**Complies.** The proposed project would be built to comply with all regulations.
Lawn and Garden Activity: Encourage the use of electrified and higher-efficiency lawn and garden equipment.	Support the BAAQMD's efforts to re-establish a voluntary exchange program for residential lawn mowers and backpack-style leaf blowers.	**Not applicable.** This measure applies to government agencies and not individual development projects.
	Encourage new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.	**Complies.** The proposed project would provide electrical outlets in accessible areas to be used for landscaping equipment per the requirements of the City Code.
	Encourage the replacement of existing high-maintenance and high-water use landscapes with low water use vegetation to reduce the need for gas-powered lawn and garden equipment.	**Complies.** The proposed project would conform to the City's WELO and other outdoor water efficiency requirements.[4]
Construction Emissions: Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes or less (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Provide clear signage at all access points to remind employees of idling restrictions.	**Complies.** As explained in Section 1.2.2, Project Description, signage would be posted at the project site throughout the duration of the construction period to require employees to comply with idling restrictions.
	Construction equipment shall be maintained in accordance with manufacturer's specifications.	**Complies.** As explained in Section 1.2.2, Project Description, all project-related construction equipment shall be maintained in accordance with manufacturer's specifications.

Table 20 (cont.): Consistency with the Santa Rosa Climate Action Plan

Measure	Action Item	Project Compliance
	Work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: a. Substitute electrified equipment for diesel- and gasoline-powered equipment where practical. b. Use alternative fuels for construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel. c. Avoid the use of on-site generators by connecting to grid electricity or utilizing solar-powered equipment.	**Complies.** As explained in Section 1.2.2, Project Description, the proposed project would implement measures to reduce potential exposure of DPM and $PM_{2.5}$ emissions to sensitive receptors located near the project site. All project-related off-road construction equipment in excess of 25 horsepower used on-site by the developer or contractors during all phases of construction shall be equipped with engines meeting the EPA Tier IV off-road engine emission standards; or, alternatively, other measures would be implemented to minimize DPM emissions to reduce the estimated cancer risk below the thresholds.

Source of policy and project requirements: City of Santa Rosa. 2012. City of Santa Rosa Climate Action Plan. Website: https://srcity.org/DocumentCenter/View/10762. Accessed: September 9, 2019.

[1] California Energy Commission (CEC). 2019. 2019 Building Energy Efficiency Standards. Website: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency. Accessed October 2, 2019.

[2] City of Santa Rosa. 2009. City of Santa Rosa General Plan 2035. November 3. Website: https://srcity.org/392/General-Plan. Accessed September 13, 2019.

[3] City of Santa Rosa. 2019. Santa Rosa City Code, Chapter 17-24 Trees. Website: https://qcode.us/codes/santarosa/view.php?topic=17-17_24-iii-17_24_030&frames=on. Accessed September 27, 2019

[4] City of Santa Rosa. 2019. Santa Rosa City Code, Chapter 14-30 Water Efficient Landscape. Website: https://qcode.us/codes/santarosa/. Accessed September 26, 2019.

Santa Rosa Climate Action Plan New Development Checklist

To ensure new development projects are compliant with the Santa Rosa Climate Action Plan, the City of Santa Rosa developed the New Development Checklist below. According to the City of Santa Rosa's Planning Department, a new checklist is currently being developed; however, the checklist below is appropriate for present use. The City's Planning Department has previously required this checklist to show compliance with the City's Climate Action Plan. While the Planning Department no longer requires this checklist, it is still strongly recommended that all measures be addressed.[97] Project compliance with this checklist is shown in Table 21. Measures denoted with an asterisk are required in all new development projects. As shown in the table, the proposed project would comply with all applicable requirements.

Table 21: Consistency with Santa Rosa's Climate Action Plan New Development Checklist

New Development Checklist Measures	Project Consistency
Required Measures	
1.1.1: Comply with CALGreen Tier 1 standards*	**Complies.** The proposed project would implement required green building strategies to comply with Tier 1 CALGreen standards. The proposed project includes sustainability design features that support the Green Building Strategy.[1]
1.1.3: After 2020, all new development will utilize zero net electricity*	**Complies.** The proposed project would be required to comply with California's Building Energy Efficiency Standards.[1]
1.3.1: Install real-time energy monitors to track energy use*	**Complies.** The proposed project would be built to comply with all regulations.
1.4.2: Comply with the City's tree preservation ordinance*	**Complies.** The proposed project site contains multiple trees, particularly in the northeast corner and near the western boundary of the project site. If any tree removal is proposed, the proposed project would be required to comply with the City's tree preservation ordinance.[2]
1.4.3: Provide public & private trees in compliance with the Zoning Code*	**Complies.** The proposed project would be required to comply with the City's Zoning Code.
1.5: Install new sidewalks and paving with high solar reflectivity materials*	**Complies.** The proposed project would be required to construct paved areas in accordance with City standards.
4.1.2: Install bicycle parking consistent with regulations*	**Complies.** The proposed project would install bicycle parking consistent with regulations.
4.3.5: Encourage new employers of 50+ to provide subsidized transit passes*	**Not applicable.** The proposed project is a residential development and would not have new employees.
5.2.1: Provide alternative fuels at new refueling stations*	**Not applicable.** The proposed project would not include refueling stations.

[97] City of Santa Rosa Planning Department. 2019. Telephone correspondence related to the Santa Rosa Climate Action Plan New Development Checklist. September 20.

Table 21 (cont.): Consistency with Santa Rosa's Climate Action Plan New Development Checklist

New Development Checklist Measures	Project Consistency
6.1.3: Increase diversion of construction waste*	**Complies.** The proposed project would be required to comply with existing regulations.
7.1.1: Reduce potable water use for outdoor landscaping*	**Complies.** The proposed project would conform to the City's WELO and other outdoor water efficiency requirements.
7.1.3: Use water meters which track real-time water use*	**Complies.** The proposed project would include water meters in accordance with City standards.
7.3.2: Meet on-site meter separation requirements in locations with current or future recycled water capabilities*	**Not applicable.** The proposed project is not located in an area with meter separation requirements. If applicable, the proposed project would comply.
9.1.3: Install low water use landscapes*	**Complies.** The proposed project would conform to the City's WELO, which requires low water use landscape designs.[4]
9.2.1: Minimize construction equipment idling time to 5 minutes or less*	**Complies.** The proposed project would ensure that construction equipment idling time is minimized to 5 minutes or less.
9.2.2: Maintain construction equipment per manufacturer's specs*	**Complies.** The proposed project would maintain construction equipment per manufacturer's specs.
9.2.3: Limit GHG construction equipment emissions by using electrified equipment or alternative fuels*	**Complies.** Emissions from construction equipment would be limited by MM 3.3.3 and MM 3.3.5 of the 2016 Roseland Area/Sebastopol Road Specific Plan and Roseland Area Annexation Projects.
Voluntary Measures	
2.1.3: Pre-wire and pre-plumb for solar thermal or PV systems	**Not proposed.** This is a voluntary measure that is not proposed at this time.
3.1.2: Support implementation of station plans and corridor plans	**Complies.** The project site is located south of both the Downtown Station Area Specific Plan and the Sebastopol Road Corridor Plan (he project site is located approximately 0.46 mile south of Sebastopol Road).[5,6] The proposed project would not impede the implementation of either of these nearby plans or any other station or corridor plan.
3.2.1: Provide on-site services such as ATMs or dry cleaning to site users	**Not applicable.** The proposed project is a residential development and would not include a commercial component.
3.2.2: Improve non-vehicular network to promote walking, biking	**Complies.** The proposed project would add bike lanes, sidewalks, and planter strips to promote walking and biking and connectivity to other land uses and the roadway network.

Table 21 (cont.): Consistency with Santa Rosa's Climate Action Plan New Development Checklist

New Development Checklist Measures	Project Consistency
3.2.3: Support mixed-use, higher-density development near services	**Complies.** The proposed project would support higher density development. The Santa Rosa General Plan 2035 designates the project site as Medium-Low density, which permits between 8-13 units per acre and is intended for attached single-family residential development (but single-family detached housing and multi-family development may also be permitted). The proposed project would have a density of 9.5 units per acre.
3.3.1: Provide affordable housing near transit	**Complies.** The proposed project would be comprised of 46 percent affordable housing units, and the project site is located approximately 0.1-mile from the nearest bus stop located on Delport Avenue at McMinn Avenue.
3.5.1: Unbundle parking from property cost	**Not applicable.** The proposed project is a residential development and would not include a commercial component.
3.6.1: Install calming features to improve pedestrian/bike experience	**Complies.** The proposed project would install planters between traffic and pedestrians to provide traffic-calming features to improve pedestrian/bike experience.
4.1.1: Implement the Bicycle and Pedestrian Master Plan	**Complies.** The proposed project would support implementation of the Bicycle and Pedestrian Master Plan by adding a bicycle lane to Burbank Avenue.
4.1.3: Provide bicycle safety training to residents, employees, motorists	**Not proposed.** This is a voluntary measure that is not proposed at this time.
4.2.2: Provide safe spaces to wait for bus arrival	**Complies.** The proposed project would provide safe spaces to wait for bus arrival.
4.3.2: Work with large employers to provide rideshare programs	**Not applicable.** The proposed project is a residential development and would not have employees.
4.3.3: Consider expanding employee programs promoting transit use	
4.3.4: Provide awards for employee use of alternative commute options	
4.3.7: Provide space for additional park-and-ride lots	**Not proposed.** This is a voluntary measure that is not proposed at this time.
4.5.1: Include facilities for employees that promote telecommuting	**Not applicable.** The proposed project is a residential development and would not include a commercial component.
5.1.2: Install electric vehicle charging equipment	**Complies.** The proposed project would install electric vehicle charging equipment.

Table 21 (cont.): Consistency with Santa Rosa's Climate Action Plan New Development Checklist

New Development Checklist Measures	Project Consistency
8.1.3: Establish community gardens and urban farms	**Complies.** The proposed project would provide outdoor green areas and garden opportunities throughout.
9.1.2: Provide outdoor electrical outlets for charging lawn equipment	**Complies.** The proposed project would provide electrical outlets for charging lawn equipment.

Notes:
* Measures denoted with an asterisk are required in all new development projects.

Source of policy and project requirements:
City of Santa Rosa. 2012. City of Santa Rosa Climate Action Plan, Appendix B: CAP New Development Checklist. Website: https://srcity.org/DocumentCenter/View/10762. Accessed September 20, 2019.
[1] California Energy Commission. 2019. Building Energy Efficiency Standards—Title 24. Website: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards. Accessed September 20, 2019.
[2] City of Santa Rosa. 2019. Santa Rosa Municipal Code, Chapter 17-24. Website: https://qcode.us/codes/santarosa/. Accessed September 20, 2019.
[3] City of Santa Rosa. 2019. Santa Rosa Municipal Code, Chapter 19-08. Website: https://qcode.us/codes/santarosa/. Accessed September 20, 2019.
[4] City of Santa Rosa. 2019. Santa Rosa City Code, Chapter 14-30 Water Efficient Landscape. Website: https://qcode.us/codes/santarosa/. Accessed September 26, 2019.
[5] City of Santa Rosa. 2019. Santa Rosa Downtown Station Area Specific Plan Update. Website: https://www.plandowntownsr.com/. Accessed December 3, 2019.
[6] City of Santa Rosa. 2007. Sebastopol Road Corridor Plan. June. Website: https://srcity.org/DocumentCenter/View/18333/Sebastopol-Rd-Corridor-Plan. Accessed December 3, 2019.

SB 32 2017 Scoping Plan Update

The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017.[98] Table 22 provides an analysis of the proposed project's consistency with the 2017 Scoping Plan Update measures. As shown in Table 22, these measures are more focused at the statewide implementation level and are not as applicable to local, project-level developments. Nevertheless, this analysis provides a description of each measure and if the measures are applicable to the proposed project.

[98] California Air Resources Board (ARB). 2017. The 2017 Climate Change Scoping Plan Update, the Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. January 17. Website: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed June 1, 2018.

Table 22: Consistency with SB 32 2017 Scoping Plan Update

2017 Scoping Plan Update Reduction Measure	Project Consistency
SB 350: 50 Percent Renewable Mandate. Utilities subject to the legislation will be required to increase their renewable energy mix from 33 percent in 2020 to 50 percent in 2030.	**Not applicable.** This measure would apply to utilities and not to individual development projects. The proposed project would purchase electricity from PG&E or SCP subject to the SB 350 Renewable Mandate.
SB 350: Double Building Energy Efficiency by 2030. This is equivalent to a 20 percent reduction from 2014 building energy usage compared to current projected 2030 levels.	**Not applicable.** This measure applies to existing buildings. The proposed project proposes to demolish existing buildings on the project site and construct new residential buildings.
Low Carbon Fuel Standard. This measure requires fuel providers to meet an 18 percent reduction in carbon content by 2030.	**Not applicable.** This is a Statewide measure that cannot be implemented by a project applicant or lead agency. However, vehicles accessing the proposed building at the project site would be benefit from the standards.
Mobile Source Strategy (Cleaner Technology and Fuels Scenario). Vehicle manufacturers will be required to meet existing regulations mandated by the LEV III and Heavy-Duty Vehicle programs. The strategy includes a goal of having 4.2 million Zero Emission Vehicles (ZEVs) on the road by 2030 and increasing numbers of ZEV trucks and buses.	**Not applicable.** This measure is not applicable to the proposed project; however, vehicles accessing the single-family houses, duplexes, and multi-family apartments at the project site would be benefit from the increased availability of cleaner technology and fuels.
Sustainable Freight Action Plan. The plan's target is to improve freight system efficiency 25 percent by increasing the value of goods and services produced from the freight sector, relative to the amount of carbon that it produces by 2030. This would be achieved by deploying over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	**Not applicable.** This measure applies to owners and operators of trucks and freight operations. The proposed project is residential in nature and would not support truck and freight operations. It is expected that deliveries throughout the State would be made with an increasing number of ZEV delivery trucks, including deliveries that would be made to future residents.
Short-Lived Climate Pollutant (SLCP) Reduction Strategy. The strategy requires the reduction of SLCPs by 40 percent from 2013 levels by 2030 and the reduction of black carbon by 50 percent from 2013 levels by 2030.	**Not applicable.** Consistent with BAAQMD Regulation 6, Rule 3, no wood-burning devices are proposed as part of the project. Natural gas hearths produce very little black carbon compared to wood-burning fireplace; therefore, the proposed project would not include major sources of black carbon.
SB 375 Sustainable Communities Strategies. Requires Regional Transportation Plans to include a sustainable communities strategy for reduction of per capita vehicle miles traveled.	**Not applicable.** The proposed project does not include the development of a Regional Transportation Plan.
Post-2020 Cap-and-Trade Program. The Post 2020 Cap-and-Trade Program continues the existing program for another 10 years. The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers.	**Not applicable.** The proposed project is not one targeted by the cap-and-trade system regulations, and, therefore, this measure does not apply to the proposed project.

Table 22 (cont.): Consistency with SB 32 2017 Scoping Plan Update

2017 Scoping Plan Update Reduction Measure	Project Consistency
Natural and Working Lands Action Plan. The ARB is working in coordination with several other agencies at the federal, State, and local levels, stakeholders, and with the public, to develop measures as outlined in the Scoping Plan Update and the governor's Executive Order B-30-15 to reduce GHG emissions and to cultivate net carbon sequestration potential for California's natural and working land.	**Not applicable**. The proposed project is in a built-up urban area and would not be considered natural or working lands.
Source of ARB 2017 Scoping Plan Update Reduction Measures: California Air Resources Board. 2017. California's 2017 Climate Change Scoping Plan. November. Website: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed September 9, 2019.	

Project consistency with the goals, policies, and actions set forth in the Santa Rosa Climate Action Plan ensures that the proposed project would not impede or interfere with the City's goal to achieve the AB 32 state-recommended reduction targets. The proposed project is consistent with the Santa Rosa Climate Action Plan's applicable local plans, policies, and regulations and would not conflict with the provisions of AB 32, the applicable air quality plan, or any other State or regional plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. Furthermore, as shown in Table 22, implementation of the proposed project would not conflict with the reduction measures proposed in SB 32. As discussed under Impact GHG-1, the proposed project's generation of GHG emissions would be considered less than significant as well. In addition, the applicable Climate Action Plan measures identified in Table 20 are included as part of the proposed project design and would reduce project-related GHG emissions consistent with the Climate Action Plan measures. Therefore, the proposed project would comply with applicable plans with objectives of reducing GHG emissions, and this impact would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Less than significant impact.