

## Appendix 5.3-1 Air Quality & Greenhouse Gas Emissions Assessment

## Appendices

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# **Air Quality & Greenhouse Gas Emissions Assessment**

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## **City of Rio Vista 2045 General Plan Update Rio Vista, California**

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General Plan 2001

**LIST OF ACRONYMS AND ABBREVIATIONS**

<b>Term</b>	<b>Description</b>
AB	Assembly Bill
ATCM	Airborne toxics control measure
BAAQMD	Bay Area Air Quality Management District
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CAFE	Corporate Average Fuel Economy
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CH <sub>4</sub>	Methane
City	City of Rio Vista
CNG	Compressed Natural Gas
CO	Carbon monoxide
County	Solano County
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalents
DPM	Diesel particulate matter
EO	Executive Order
EV	Electric Vehicle
FAR	Floor Area Ratio
GHG	Greenhouse gas emissions
GSP	Gross State Product
GWP	Global Warming Potential
HRA	Health Risk Assessment
HVAC	Heating, Ventilation, and Air Conditioning
IPCC	Intergovernmental Panel on Climate Change
µg/m <sup>3</sup>	Micrograms per cubic meter

## **LIST OF ACRONYMS AND ABBREVIATIONS**

<b>Term</b>	<b>Description</b>
LNG	Liquified Natural Gas
MPO	Metropolitan Planning Organization
MT	Metric Tons
N <sub>2</sub> O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NHTSA	National Highway Safety Administration
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrous oxides
O <sub>3</sub>	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
parts per million	ppm
YSAQMD	Solano County Air Quality Management District
PM <sub>10</sub>	Coarse particulate matter
PM <sub>2.5</sub>	Fine particulate matter
ppm	Parts per million
Project	City of Rio Vista 2045 General Plan Project
ROG	Reactive organic gases
SAFE	Safer Affordable Fuel Efficient
SB	Senate Bill
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SR-12	State Route 12
SVAB	Sacramento Valley Air Basin
SO <sub>x</sub>	Sulfur oxides
SO <sub>2</sub>	Sulfur dioxide
TACs	Toxic air contaminants
USEPA	U.S. Environment Protection Agency
VMT	Vehicle Miles Traveled
VOC	Volatile organic compounds
YSAQMD	Yolo-Solano Air Quality Management District
ZEV	Zero Emission Vehicle

## **1.0 INTRODUCTION**

This report describes the potential impacts to air quality and greenhouse gas (GHG) emissions due to the implementation of the proposed City of Rio Vista 2045 General Plan Update. This section describes the regulatory framework and existing conditions, identifies criteria used to determine impact significance, provides an analysis of the potential air quality and/or GHG-related impacts, and identifies General Plan policies and feasible mitigation measures that could minimize any potentially significant impacts. This report was prepared using methodologies and assumptions recommended in the rules and regulations of the Yolo-Solano Air Quality Management District (YSAQMD). Regional and local existing conditions are presented, along with pertinent emissions standards and regulations.

### **1.1 Project Location and Description**

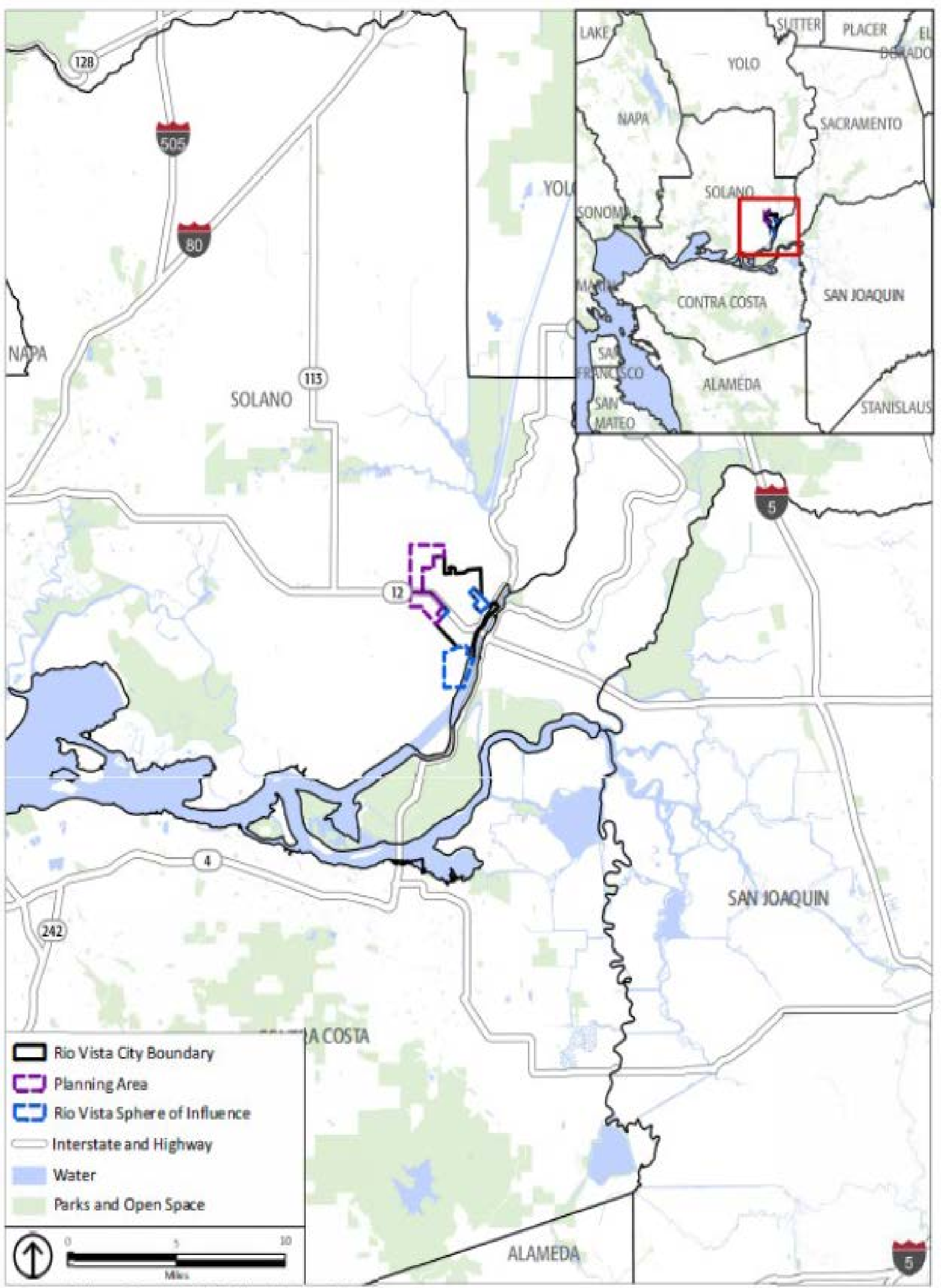
The City of Rio Vista (City) is the eastern-most incorporated city in Solano County, located on the banks of the Sacramento River. Rio Vista is bordered by unincorporated Solano County lands. The City covers an area of 7.5 square miles and is bisected by State Route 12 (SR-12). Rio Vista is a small community located in the heart of the Sacramento River Delta. The main highway, SR-12, provides a corridor from Lodi and Stockton in the Central Valley to Suisun City, Fairfield and the counties of the northern Bay Area. Figure 1-1, Regional Location, shows the General Plan area in its regional context.

The General Plan establishes the community's long-term vision for the future, including where people in Rio Vista will live, work, shop, and recreate. It serves as guidance for all zoning and land use decisions within the City. It will shape future housing, support job growth, foster healthy and resilient neighborhoods, protect and manage natural resources, ensure community safety, and promote social and economic equity. The proposed General Plan Update does not make major changes in land use, but is focused on shortening the existing document, consolidating goals and policies into a more user-friendly document, and recognizing the need for different styles of development than were prevalent with the existing "General Plan 2001", adopted in 1998. The proposed General Plan Update policy document contains the goals and policies that will guide future decisions within the City and identifies implementation measures to ensure the vision and goals of the General Plan are carried out. The General Plan Update also contains a land use diagram, which serves as a general guide to the distribution of land uses throughout the City. The General Plan Update addresses all the elements required by State law, in addition to optional elements that the City has elected to include, as listed here:

- Land Use Element and Community Character
- Mobility and Circulation Element
- Economic Development (Optional Element)
- Housing Element (Stand-alone Element)
- Parks and Recreation Element
- Open Space and Resource Conservation Element
- Public Facilities and Services Element

- Safety Element
- Noise Element

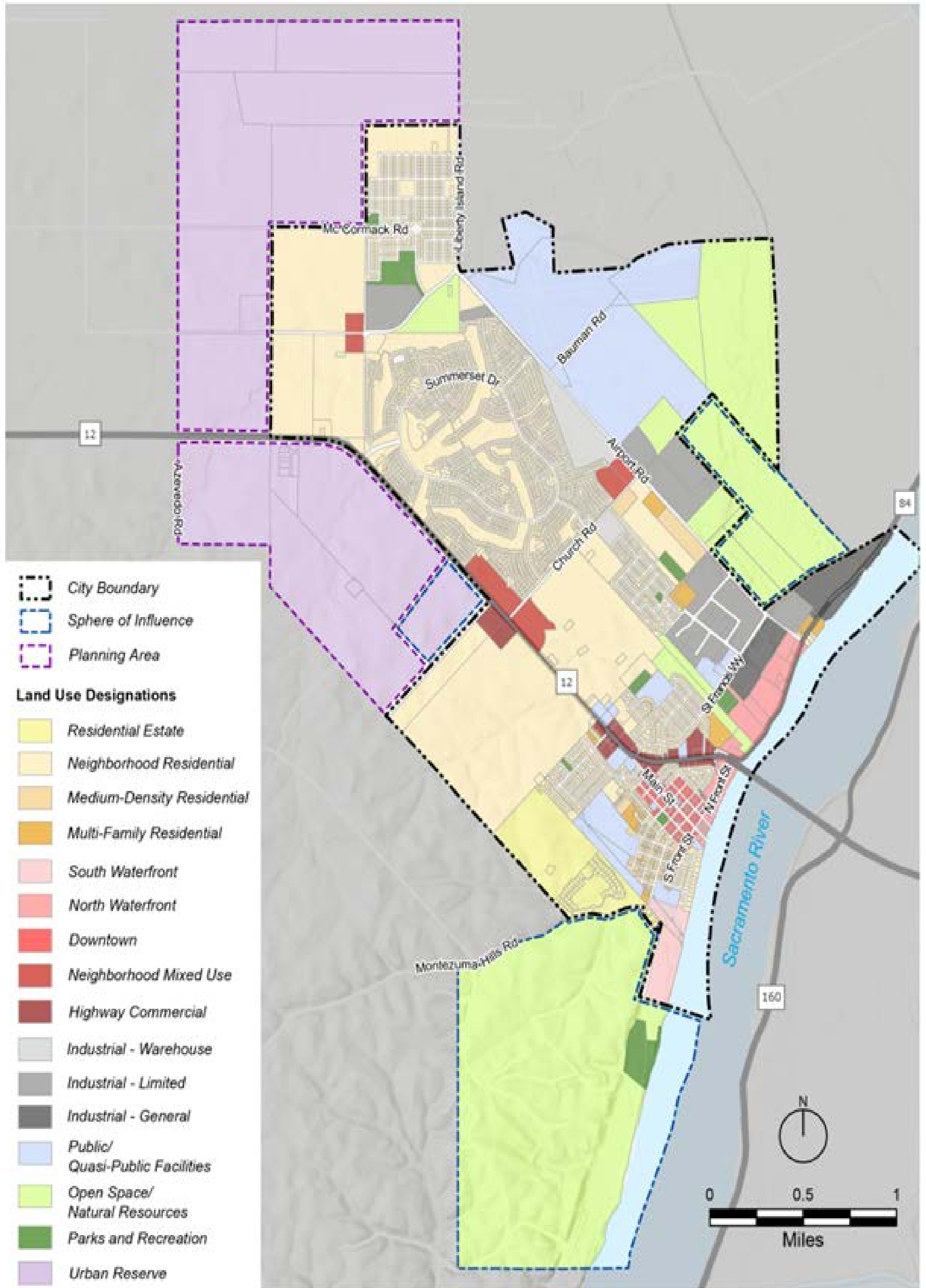
The Existing General Plan 2001 land area consists of 5,130 acres (8.0 square miles) within the City limits, and 1,750 acres (2.7 square miles) within the Sphere of Influence. The total land area covered by this proposed 2045 General Plan Update is 6,880 acres (10.8 square miles). Figure 1-2, Proposed Land Use Plan Diagram, illustrates the proposed 2045 General Plan Update land use diagram.



Source: Solano County 2024, PlaceWorks 2024

**Figure 1-1. Regional Location**

2023-156 City of Rio Vista General Plan Update



**Figure 1-2 Proposed Land Use Designations**  
 2023-156 City of Rio Vista General Plan Update

## **2.0 AIR QUALITY**

This section includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential construction and operational air quality impacts caused by future development allowed under the proposed 2045 General Plan Update.

### **2.1 Environmental Setting**

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below, together with the current regulatory structure that applies to the Sacramento Valley Air Basin (SVAB), in which Rio Vista is located, pursuant to the regulatory authority of the YSAQMD. The YSAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

Ambient air quality is commonly characterized by climate conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The air basin is subject to a combination of topographical and climatic factors that reduce the potential for high levels of regional and local air pollutants. The following section describes the pertinent characteristics of the air basin and provides an overview of the physical conditions affecting pollutant dispersion in the City of Rio Vista.

#### **2.1.1 Sacramento Valley Air Basin**

The California Air Resources Board (CARB) divides the state into air basins that share similar meteorological and topographical features. The Project Site is located in the SVAB, in a portion of area that is under the jurisdiction of the YSAQMD. The air basin is relatively flat, bordered by mountains to the east, west, and north and by the San Joaquin Valley to the south. Air flows into the SVAB through the Carquinez Strait, moving across the Sacramento Delta, and bringing pollutants from the heavily populated San Francisco Bay Area. The climate is characterized by hot, dry summers and cool, rainy winters. Characteristic of SVAB winter weather are periods of dense and persistent low-level fog, which are most prevalent between storm systems. From May to October, the region's intense heat and sunlight lead to high ozone pollutant concentrations. Summer inversions are strong and frequent but are less troublesome than those that occur in the fall. Autumn inversions, formed by warm air subsiding in a region of high pressure, have accompanying light winds that do not provide adequate dispersion of air pollutants.

#### **2.1.2 Criteria Air Pollutants**

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health with a determined margin of safety. Ozone (O<sub>3</sub>), coarse particulate matter (PM<sub>10</sub>), and fine particulate matter (PM<sub>2.5</sub>) are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>) are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered a local pollutant. Health effects commonly associated with criteria pollutants are summarized in Table 2-1.

<b>Pollutant</b>	<b>Major Manmade Sources</b>	<b>Human Health and Welfare Effects</b>
CO	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
NO <sub>2</sub>	A reddish-brown gas formed during fuel combustion for motor vehicles, energy utilities and industrial sources.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Causes brown discoloration of the atmosphere.
O <sub>3</sub>	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrogen oxides (NO <sub>x</sub> ) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, solvents, paints and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield.
PM <sub>2.5</sub> & PM <sub>10</sub>	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
SO <sub>2</sub>	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.

Source: California Air Pollution Control Offices Association (CAPCOA 2013)

### **2.1.2.1 Carbon Monoxide**

CO in the urban environment is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches, aggravate cardiovascular disease and impair central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations of CO are typically found near crowded intersections and along heavy roadways with slow moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within relatively short distances (i.e., up to 600 feet or 185 meters) of the source. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

### **2.1.2.2 Nitrogen Oxides**

Nitrogen gas comprises about 80 percent of the air and is naturally occurring. At high temperatures and under certain conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitric oxides (NO<sub>x</sub>). Motor vehicle emissions are the main source of NO<sub>x</sub> in urban areas. NO<sub>x</sub> is very toxic to animals and humans because of its ability to form nitric acid with water in the eyes,

lungs, mucus membrane, and skin. In animals, long-term exposure to NO<sub>x</sub> increases susceptibility to respiratory infections, and lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations can suffer from lung irritation or possible lung damage. Precursors of NO<sub>x</sub>, such as NO and NO<sub>2</sub>, attribute to the formation of O<sub>3</sub> and PM<sub>2.5</sub>. Epidemiological studies have also shown associations between NO<sub>2</sub> concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

### **2.1.2.3 Ozone**

Ozone (O<sub>3</sub>) is a secondary pollutant, meaning it is not directly emitted. It is formed when volatile organic compounds (VOCs) also known as reactive organic gases (ROG) and NO<sub>x</sub> undergo photochemical reactions that occur only in the presence of sunlight. The primary source of ROG emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. Sunlight and hot weather cause ground-level O<sub>3</sub> to form. Ground-level O<sub>3</sub> is the primary constituent of smog. Because O<sub>3</sub> formation occurs over extended periods of time, both O<sub>3</sub> and its precursors are transported by wind and high O<sub>3</sub> concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when O<sub>3</sub> levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level O<sub>3</sub> exposure to a variety of problems including lung irritation, difficult breathing, permanent lung damage to those with repeated exposure, and respiratory illnesses.

### **2.1.2.4 Sulfur Dioxide**

SO<sub>2</sub> is a colorless gas with a pungent odor, however sulfur dioxide can react with other particulates in the atmosphere to form particulates which contribute to the haze effect. SO<sub>2</sub> standards have been developed by the EPA to regulate all sulfur oxides, however SO<sub>2</sub> is by far the most abundant sulfur oxide in the atmosphere. Currently, SO<sub>2</sub> is primarily a result of the burning of fossil fuels for power generation and other industrial sources. Modern regulations on diesel fuel have greatly reduced the amount of SO<sub>2</sub> in the atmosphere and there are currently no areas in California that have nonacceptable levels of SO<sub>2</sub>, by state or federal standards.

### **2.1.2.5 Particulate Matter**

Particulate matter includes both aerosols and solid particulates of a wide range of sizes and composition. Of concern are those particles smaller than or equal to 10 microns in diameter size (PM<sub>10</sub>) and small than or equal to 2.5 microns in diameter (PM<sub>2.5</sub>). Smaller particulates are of greater concern because they can penetrate deeper into the lungs than larger particles. PM<sub>10</sub> is generally emitted directly as a result of mechanical processes that crush or grind larger particles or form the resuspension of dust, typically through construction activities and vehicular travel. PM<sub>10</sub> generally settles out of the atmosphere rapidly and is not readily transported over large distances. PM<sub>2.5</sub> is directly emitted in combustion exhaust and is formed in atmospheric reactions between various gaseous pollutants, including NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>) and VOCs. PM<sub>2.5</sub> can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

The principal health effects of airborne PM are on the respiratory system. Short-term exposure of high PM<sub>2.5</sub> and PM<sub>10</sub> levels are associated with premature mortality and increased hospital admissions and emergency room visits. Long-term exposure is associated with premature mortality and chronic respiratory disease. According to the U.S. Environmental Protection Agency (USEPA), some people are much more sensitive than others to breathing PM<sub>10</sub> and PM<sub>2.5</sub>. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM<sub>10</sub> and PM<sub>2.5</sub>. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths.

### **2.1.3 Toxic Air Contaminants**

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Carcinogenic TACs can also have noncarcinogenic health hazard levels.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Additionally, diesel engines emit a complex mixture of air pollutants composed of gaseous and solid material. The solid emissions in diesel exhaust are known as diesel particulate matter (DPM). In 1998, California identified DPM as a TAC based on its potential to cause cancer, premature death, and other health problems (e.g., asthma attacks and other respiratory symptoms). Those most vulnerable are children (whose lungs are still developing) and the elderly (who may have other serious health problems). Overall, diesel engine emissions are responsible for the majority of California's known cancer risk from outdoor air pollutants. Diesel engines also contribute to California's PM<sub>2.5</sub> air quality problems. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

#### **2.1.3.1 Diesel Exhaust**

CARB has identified DPM as a TAC. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine (USEPA 2002). Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-

headedness, and nausea. DPM poses the greatest health risk among the TACs; due to their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

### 2.1.4 Ambient Air Quality

Ambient air quality in Rio Vista can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. CARB maintains more than 60 monitoring stations throughout California. O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are the pollutant species most potently affecting the Rio Vista region. As described in detail below, the region is designated nonattainment for the federal standards of O<sub>3</sub> and PM<sub>2.5</sub> and is nonattainment for the State standards of O<sub>3</sub> and PM<sub>10</sub>. Solano County contains several air quality monitors throughout the area, which capture the ambient concentrations of O<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>. The Vacaville-Ulatis Drive and Vacaville-Merchant Street air quality monitoring stations monitor O<sub>3</sub> and PM<sub>10</sub>, respectively. The Davis-UCD Campus air quality monitoring station is the closest PM<sub>2.5</sub> monitoring station to Rio Vista, approximately 8 miles to the north. Table 2-2 summarizes the air quality data from the most recent years that is relevant to Rio Vista. Ambient emission concentrations will vary due to localized variations in emission sources and climate, yet these measurements should be considered “generally” representative of ambient concentrations in the City.

<b>Table 2-2. Summary of Ambient Air Quality Data in Rio Vista</b>			
<b>Pollutant Scenario</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>O<sub>3</sub></b>			
Max 1-hour concentration (ppm)	0.095	0.086	0.075
Max 8-hour concentration (ppm) (state/federal)	0.078 / 0.078	0.068 / 0.069	0.069 / 0.069
Number of days above 1-hour standard (state/federal)	1 / 0	0 / 0	0 / 0
Number of days above 8-hour standard (state/federal)	0 / 0	0 / 0	0 / 0
<b>PM<sub>10</sub></b>			
Max 24-hour concentration (µg/m <sup>3</sup> ) (state/federal)	49.6 / 50.0	35.4 / 33.4	38.1 / 37.6
Number of days above 24-hour standard (state/federal)	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0
<b>PM<sub>2.5</sub>**</b>			
Max 24-hour concentration (µg/m <sup>3</sup> ) (state/federal)	66.2 / *	31.3 / *	38.3 / *
Number of days above federal 24-hour standard	*	*	*

Source: CARB 2024a

Note: \*\* = PM<sub>2.5</sub> measurements were taken from the Davis-UCD Campus air quality monitoring station. This is the closest monitor to Rio Vista that provides data for PM<sub>10</sub>, and the only air quality monitoring station in Solano County that monitors PM<sub>2.5</sub>.

\* = Insufficient data available

µg/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million

The USEPA and CARB designate air basins or portions of air basins and counties as being in “attainment” or “nonattainment” for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> are

based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards (CAAQS) are not to be exceeded during a three-year period. The attainment status for Rio Vista portion of Solano County is presented in Table 2-3.

<b>Pollutant</b>	<b>State Designation</b>	<b>Federal Designation</b>
O <sub>3</sub>	Nonattainment - Transitional	Nonattainment
PM <sub>10</sub>	Nonattainment	Unclassified
PM <sub>2.5</sub>	Unclassified	Nonattainment
CO	Attainment	Unclassified/Attainment
NO <sub>2</sub>	Attainment	Unclassified/Attainment
SO <sub>2</sub>	Attainment	Unclassified/Attainment

Source: CARB 2023

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. As shown above, sometimes areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The Solano County region is designated as a nonattainment area for the federal O<sub>3</sub> and PM<sub>2.5</sub> standards and is also a nonattainment area for the state standards for O<sub>3</sub> and PM<sub>10</sub> (CARB 2023).

### **2.1.5 Sensitive Receptors**

Sensitive receptors are defined as 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 of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

Because placement of sensitive land uses falls outside CARB’s jurisdiction, CARB developed and approved the Air Quality and Land Use Handbook: A Community Health Perspective (2005) to address the siting of sensitive land uses in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources. CARB’s recommendations on the siting of new sensitive land uses identified in Table 2-4 were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources.

<b>Source/Category</b>	<b>Advisory Recommendations</b>
Freeways and High-Traffic Roads	Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day
Distribution Centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units per day, or where transport refrigeration units unit operations exceed 300 hours per week). Take into account the configuration of existing distribution centers and avoid locating residences and other sensitive land uses near entry and exit points.
Rail Yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks
Refineries	Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with three or more machines, consult with the local air district. Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations
Gasoline Dispensing Facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities

Source: CARB 2005

The key observation in these studies is that proximity to air pollution sources substantially increases both exposure and the potential for adverse health effects. There are three carcinogenic TACs that constitute the majority of the known health risks from motor vehicle traffic: DPM from trucks and benzene and 1,3-butadiene from passenger vehicles. In 2017, CARB provided a supplemental technical advisory to the handbook for near-roadway air pollution exposure, titled Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways. Strategies include practices and technologies that reduce traffic emissions, increase dispersion of traffic pollution (or the dilution of pollution in the air), or remove pollution from the air (CARB 2017).

## **2.1.6 Odors**

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

## **2.2 Regulatory Framework**

### **2.2.1 Federal**

#### **2.2.1.1 Clean Air Act**

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the USEPA to establish the NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The USEPA has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. Table 2-3 lists the federal attainment status of the Rio Vista region for the criteria pollutants.

## **2.2.2 State**

### **2.2.2.1 California Clean Air Act**

The California Clean Air Act (CCAA) allows the state to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the CAAQS. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

### **2.2.2.2 California State Implementation Plan**

The federal CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The USEPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register. The YSAQMD is the agency responsible for ensuring that NAAQS and CAAQS are not exceeded. The 2017 Sacramento Regional 2008 8-Hour Ozone Attainment and Reasonable Further Progress Plan (including 2018 updates), the PM<sub>10</sub> Implementation/Maintenance Plan and Re-Designation Request (2010), and PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request for Sacramento PM<sub>2.5</sub> Nonattainment Area (2013) constitute the current SIP for Solano County. These air quality planning documents present comprehensive strategies to reduce the O<sub>3</sub> precursor pollutants (ROG and NO<sub>x</sub>) as well as PM emissions from stationary, area, mobile, and indirect sources.

### **2.2.2.3 Pavley Fuel Efficiency Standards**

Pavley I is a clean-car standard that reduces emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016. In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025.

### **2.2.2.4 CARB's Mobile Source Strategy**

In September 2021, CARB developed the 2020 Mobile Source Strategy that, similar to the 2016 Mobile Source Strategy, is a framework to identify the technology trajectories and programmatic concepts to meet criteria pollutant, GHG, and TAC emission reduction goals from mobile sources. The 2020 Mobile Source Strategy will deliver broad environmental and public health benefits, as well as support much needed efforts to modernize and upgrade transportation infrastructure, enhance system-wide efficiency and mobility options, and promote clean economic growth in the mobile sector.

### **2.2.2.5 Governor's Executive Order B-48-18: Zero-Emission Vehicles**

On January 26, 2018, Governor Brown signed Executive Order (EO) B-48-18 requiring all state entities to work with the private sector to have at least 5 million zero emission vehicles (ZEVs) on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle (EV) charging stations by 2025. It specifies that 10,000 of the EV charging stations should be direct current fast chargers. The order requires all state entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to assist in these efforts. All state entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan, along with the 2018 ZEV Action Plan Priorities Update, which includes and extends the 2016 ZEV Action Plan (Caltrans 2016; 2018), to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities.

### **2.2.2.6 Governor's Executive Order N-79-20**

Governor Newsom signed EO N-79-20 in September 2020, which sets a statewide goal that 100 percent of all new passenger car and truck sales in the state will be zero-emissions by 2035. It also sets a goal that 100 percent of statewide new sales of medium- and heavy-duty vehicles will be zero emissions by 2045, where feasible, and for all new sales of diesel-fuel heavy duty trucks to be zero emissions by 2035. Additionally, the EO targets 100 percent of new off-road vehicle sales in the state to be zero emission by 2035. CARB is responsible for implementing the new vehicle sales regulations.

### **2.2.2.7 California Code of Regulations (CCR) Title 20: Appliance Energy Efficiency Standards**

The 2006 Appliance Efficiency Regulations (20 CCR secs. 1601–1608) were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December

14, 2006. The regulations include standards for both federally regulated appliances and non– federally regulated appliances. This code reduces natural gas use from appliances.

**2.2.2.8 24 CCR, Part 6: Building and Energy Efficiency Standards and Part 11: Green Building Standards Code**

Part 6: Building and Energy Efficiency Standards establishes energy conservation standards for new residential and nonresidential buildings adopted by the California Energy Resources Conservation and Development Commission (now the California Energy Commission) in June 1977. This code reduces natural gas use from buildings. Part 11: Green Building Standards Code establishes planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. This code reduces natural gas use from buildings. Effective January 1, 2024, the latest (2022) version of the Title 24, Part 6 Energy Code updates took effect. The 2022 Building Energy Efficiency Standards focus on regulations for energy efficiency, water efficiency and conservation, material conservation and resource efficiency, environmental quality, as well as mandatory provisions for commercial, residential, and school buildings.

**2.2.2.9 Tanner Air Toxics Act & Air Toxics “Hot Spot” Information and Assessment Act**

CARB’s Statewide comprehensive air toxics program was established in 1983 with Assembly Bill (AB) 1807, the Toxic Air Contaminant Identification and Control Act (Tanner Air Toxics Act of 1983). AB 1807 created California's program to reduce exposure to air toxics and sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an airborne toxics control measure (ATCM) for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions.

CARB also administers the state’s mobile source emissions control program and oversees air quality programs established by state statute, such as AB 2588, the Air Toxics “Hot Spots” Information and Assessment Act of 1987. Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment (HRA) and, if specific thresholds are exceeded, required to communicate the results to the public in the form of notices and public meetings. In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731, which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

**2.2.2.10 CalEnviroScreen and Disadvantaged Communities (Senate Bill 535)**

CalEnviroScreen is a mapping tool that helps identify California communities that are most affected by many sources of pollution, and where people are often especially vulnerable to pollution’s effects. This tool is used by the California Environmental Protection Agency to determine which communities are considered disadvantaged based on factors like pollution levels, demographics, and human risks. While CalEnviroScreen was originally developed as part of SB 535 and used to identify disadvantaged communities for the purposes of allocating funding from the State’s Cap-and-Trade regulation, its application and scope have

expanded over the years. The tool uses environmental, health, and socioeconomic information to produce scores for every census tract in the state. The CalEnviroScreen model is made up of four components – two pollution burden components (exposures and environmental effects) and two population characteristics components (sensitive populations and socioeconomic factors). The four components are further divided into 20 indicators. An indicator is a measure of either environmental conditions, in the case of pollution burden indicators, or health and vulnerability factors, in the case of population characteristic indicators.

**Exposure** indicators are based on the measurements of diverse types of pollution that people may come into contact with. Exposure indicators include:

- o Air Quality: Ozone
- o Air Quality: PM<sub>2.5</sub>
- o Children’s Lead Risk from Housing
- o Diesel Particular Matter
- o Drinking Water Contaminants
- o Pesticide Use
- o Toxic Releases from Facilities
- o Traffic Density

**Environmental effects** indicators are based on the locations of toxic chemicals in or near communities. Environmental effects indicators include:

- o Cleanup Sites
- o Groundwater Threats
- o Hazardous Waste Generators and Facilities
- o Impaired Water Bodies
- o Solid Waste Sites and Facilities

**Sensitive population** indicators measure the number of people in a community who may be more severely affected by pollution because of their age or health. Sensitive population indicators include:

- o Asthma
- o Cardiovascular Disease
- o Low Birth Weight Infants

**Socioeconomic factor** indicators are conditions that may increase people’s stress or make healthy living difficult and cause them to be more sensitive to pollution’s effects. Socioeconomic factors include:

- o Educational Attainment

- o Housing Burden
- o Linguistic Isolation
- o Poverty
- o Unemployment

Each census tract receives scores for as many of the 20 indicators as possible, and the scores are then mapped so that different communities can be compared. Percentiles are assigned to each census tract based on the census tract’s score in relation to the rest of the state. An area with a high percentile is one that experiences a much higher pollution burden than areas with low scores. For example, if a census tract has an indicator in the 40<sup>th</sup> percentile, it means that indicator’s percentile is higher than 40 percent of the census tracts in the state. CalEnviroScreen also provides a total (or cumulative) score, which is the product of multiplying the 10 pollution burden components by the 10 population characteristics. This total / cumulative score helps contextualize how multiple contaminants from multiple sources affect people, while considering their living conditions (e.g., nonchemical factors such as socioeconomic and health status). Communities that are within the top 25<sup>th</sup> percentile for total CalEnviroScreen scores are considered disadvantaged communities pursuant to Senate Bill (SB) 535.

According to the Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen 4.0 Map, the City of Rio Vista is in Census Tract 6095253500. This area shows an average pollution indicator percentile of 77.76 percent based on the CalEnviroScreen indicators (e.g., exposure, environmental effects, population characteristics, socioeconomic factors) and has a population of 10,676 people (OEHHA 2021). The CalEnviroScreen data indicates approximately 86 in 10,000 people in the City area’s census tract visited an emergency facility for asthma-related health issues. This rate places the City area’s census tract in the 23<sup>rd</sup> percentile, meaning the asthma rate in this census tract is higher than 23 percent of the census tracts in the State.

Census Tract 6095253500 is within the top 25 percent of total CalEnviroScreen percentiles throughout the State. It is burdened by exposure to O<sub>3</sub> but overall is subject to relatively low levels of pollution and underlying conditions. Census tract 6095253500 is in the 35<sup>th</sup> percentile for O<sub>3</sub>, meaning this census tract has higher exposure to O<sub>3</sub> than 35 percent of census tracts in the State. However, the census tract is not heavily burdened by socioeconomic factors, with a Population Characteristics Percentile of 71. The total CalEnviroScreen Percentile is 77.76, which falls within the top 25 percent, meaning the most burdened by pollution and socioeconomic factors, of all CalEnviroScreen scores statewide. Since this census tract is within the top 25 percent in scoring, according to the CalEnviroScreen methodology, it is considered a disadvantaged community pursuant to SB 535.

## **2.2.3 Local**

### **2.2.3.1 Yolo-Solano County Air Pollution Control District**

The YSAQMD is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards. The YSAQMD responsibilities include preparing plans for the attainment of ambient air quality standards, adopting and enforcing air pollution rules, issuing permits for and inspecting stationary

air pollution sources, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing state and federal programs and regulations. The YSAQMD has also adopted various rules and regulations that are designed to reduce and control pollutant emissions from project's construction and operational activities. The following provisions applicable to the Proposed Project are summarized as follows:

- **Rule 2.1: Control of Emissions:** The emission of material which may be the cause of air pollution shall be controlled.
- **Rule 2.3 Ringelmann Chart Visible Emissions:** A person shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three (3) in any one (1) hour which is: a.) As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or b.) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in section (A) above.
- **Rule 2.5 Nuisance:** A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause to have a natural tendency to cause injury or damage to businesses or property.
- **Rule 2.14 Architectural Coating:** To limit the quantity of volatile organic compounds in architectural coating supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the District.
- **Rule 2.19 Particulate Matter Process Emission Rate:** To reduce the amount of particulate matter entrained in the ambient air, or discharge into the ambient air, as a result of anthropogenic (manmade) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions.
- **Rule 3.4 New Source Review:** The purpose of this rule is to provide for the review of new and modified stationary air pollution sources and to provide mechanisms, including emission offsets, by which authorities to construct for such sources may be granted without interfering with the attainment or maintenance of ambient air quality standards.

To assist local jurisdictions in the evaluation of air quality impacts under CEQA, the YSAQMD has published a guidance document for the preparation of the air quality portions of environmental documents that include thresholds of significance to be used in evaluating land use proposals. Thresholds of significance are based on a source's projected impacts and are a basis from which to apply mitigation measures. YSAQMD's CEQA thresholds have also been used to determine air quality impacts in this analysis. According to the YSAQMD, an air quality impact is considered significant if the Proposed Project would violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

The YSAQMD’s established thresholds of significance for air quality for construction and operational activities of land use development projects are shown in Table 2-5.

<b>Table 2-5. YSAQMD Significance Thresholds</b>	
<b>Air Pollutant</b>	<b>Thresholds of Significance</b>
ROG	10 tons/year
NO <sub>x</sub>	10 tons/year
CO	Violation of a state ambient air quality standard for CO
SO <sub>2</sub>	--
PM <sub>10</sub>	80 pounds/day
PM <sub>2.5</sub>	--

Source: YSAQMD 2007

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project’s individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project’s individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulatively considerable.

## **2.3 Air Quality Emissions Impact Assessment**

### **2.3.1 Threshold of Significance**

The impact analysis provided below is based on the following California Environmental Quality Act (CEQA) Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to air quality if it would do any of the following:

- 1) Conflict with or obstruct implementation of any applicable air quality plan.
- 2) 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).
- 3) Expose sensitive receptors to substantial pollutant concentrations.
- 4) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

### **2.3.2 Methodology**

Impacts related to air quality resulting from implementation (future construction and operation) of the proposed General Plan Update are discussed below. Air quality impacts were assessed in accordance with methodologies recommended by the YSAQMD. The analysis focuses on the extent to which the 2045

General Plan Update would conflict with regional and local air quality planning and regulatory compliance efforts. O<sub>3</sub> precursors and PM emitted anywhere in the SVAB can affect air quality throughout the region; thus, any increases in O<sub>3</sub> precursors and PM associated with the 2045 General Plan Update are inherently cumulative in nature. In contrast, the effects of diesel PM, TAC or odor emissions are localized to the vicinity of their specific sources, and the cumulative context for these emissions sources would include existing and proposed future development within the Planning Area. The impact analysis is based on calculations of the criteria air pollutant and O<sub>3</sub> precursor emissions that would result from projected future growth at buildout of the 2045 General Plan Update.

Compared with buildout of the City of Rio Vista under the existing "General Plan 2001", buildout of the proposed 2045 General Plan Update would redesignate a total of 773 acres, which would allow for an additional 3,022 residential units, and an additional 113 acres of mixed-use space and 18 acres of retail spaces. Conversely, compared with buildout of the City of Rio Vista under the existing General Plan 2001, buildout of the proposed General Plan Update would reduce the amount of allowable industrial building space by 130 acres. Where criteria air pollutant quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod), version 2022.1.28. CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with operations from a variety of land use projects. The net increase in criteria air pollutant emissions for which the region is in nonattainment of ambient air quality standards (respirable and fine particulate matter, PM<sub>10</sub> and PM<sub>2.5</sub>, respectively) and O<sub>3</sub> precursors (ROG and NO<sub>x</sub>) generated by the 2045 General Plan Update were estimated based on CalEEMod default vehicle miles traveled (VMT) and General Plan land use buildout assumptions. Operational generated air pollutant emissions calculations employed land uses and acreage provided by the City coupled with the median density/intensity standards contained in the City Municipal Code. (Density/intensity standards indicate how much development is allowed on a single plot of land. A maximum permitted Floor Area Ratio (FAR) is specified for nonresidential uses. FAR refers to the ratio of building floor space compared to the square footage of the site.)

The estimated daily PM<sub>10</sub> emissions and annual average NO<sub>x</sub> and ROG operational emissions from the CalEEMod modeling results are compared to the YSAQMD thresholds of significance.

The analysis also evaluates the potential for exposure of sensitive receptors to substantial pollutant concentrations and to excessive odors according to guidance from YSAQMD (YSAQMD 2007).

### **2.3.3 Impact Analysis**

#### **2.3.3.1 Project Construction-Generated Criteria Air Quality Emissions**

The General Plan Update would accommodate future development for residential, commercial, recreational, and industrial uses. The future development and other physical changes that could result from the implementation of the General Plan Update would generate construction-related emissions of criteria air pollutants and O<sub>3</sub> precursors, including ROG, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> from site preparation (e.g., excavation, clearing), off-road equipment, material delivery, worker commute trips, and other activities (e.g., building construction, asphalt paving, application of architectural coatings). Typical construction activities that could occur with land use development include use of all-terrain forklifts, cranes, pick-up and fuel trucks,

compressors, loaders, backhoes, excavators, dozers, scrapers, pavement compactors, welders, concrete pumps, concrete trucks, and off-road haul trucks as well as other diesel-powered equipment as necessary. Fugitive dust emissions of PM<sub>10</sub> and PM<sub>2.5</sub> would be associated primarily with site preparation and grading and would vary as a function of the soil silt content, soil moisture, wind speed, acreage of disturbance, and mobile sources. Emissions of O<sub>3</sub> precursors would occur from the exhaust of construction equipment and on-road vehicles. Paving and the application of architectural coatings would also result in off-gas emissions of ROG. PM<sub>10</sub> and PM<sub>2.5</sub> would also be emitted from off-road equipment and vehicle exhaust.

Construction activities associated with the proposed General Plan Update would occur over the buildout horizon of the plan, causing short-term emissions of criteria air pollutants. For the proposed General Plan Update, which is a broad policy plan, it is not possible to determine whether the scale and phasing of individual projects would exceed the YSAQMD's thresholds of criteria pollutants of concern, as identified in Table 2-5 above, due to project-level variability and uncertainties related to future individual projects in terms of detailed site plans, construction schedules, equipment requirements, etc., which are not currently determined or even proposed. Nonetheless, depending on how development proceeds, construction-generated emissions associated with the proposed General Plan Update could potentially exceed YSAQMD thresholds of significance. Overall, air quality emissions related to construction must be addressed on a project-by-project basis, and information regarding specific development projects, soil types, and the locations of receptors would be needed to quantify the level of impact associated with construction activity.

As typically required for new discretionary development projects, the City requires that development applications be reviewed against YSAQMD quantification methodologies and significant protocols and incorporate, as conditions of approval or mitigation measures, YSAQMD-recommended pollutant-reduction measures if necessary to reduce project pollutants to levels below significance thresholds. Specifically, proposed General Plan Update Policy OSC-13 would require application of the analysis methods and significance thresholds recommended by the YSAQMD to determine a future project's air quality impacts. The YSAQMD has promulgated methodology protocols for the preparation of air quality analyses. For instance, the YSAQMD has adopted thresholds of significance depicting the approximate level of construction-generated emissions that would result in a potentially significant impact (i.e., violation of an ambient air quality standard) for each pollutant of concern. The significance criteria established by the YSAQMD may be relied upon to make a determination of impact significance level. In addition, the YSAQMD recommends appropriate emissions modeling input parameters for the Solano County region in addition to other recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements.

Projects estimated to exceed YSAQMD significance thresholds are required to implement mitigation measures in order to reduce air pollutant emissions as much as feasible. Such measures would be required to be implemented and could include, but is not limited to, the requirement that all construction equipment employ the use of the most efficient diesel engines available, which are able to reduce NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions by 60–90 percent (e.g., EPA-classified Tier 3 and/or Tier 4 engines<sup>1</sup>), and/or that construction

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<sup>1</sup> NO<sub>x</sub> emissions are primarily associated with use of diesel-powered construction equipment (e.g., graders, excavators, rubber-tired dozers, tractor/loader/backhoes). The Clean Air Act of 1990 directed the EPA to study, and regulate if warranted, the contribution of off-road internal combustion engines to urban air pollution. The first federal standards (Tier 1) for new off-road diesel engines were

equipment be equipped with diesel particulate filters. Other YSAQMD recommended air pollutant reduction measures include, but are not limited to, the following:

- The fueling of all off-road and portable diesel powered equipment with CARB certified motor vehicle diesel fuel (non-taxed version suitable for use off-road).
- The prohibition of all on and off-road diesel equipment from idling for more than 5 minutes and the posting of signs in the designated queuing areas and/or job sites to remind drivers and operators of the 5 minute idling limit.
- The prohibition of diesel idling within 1,000 feet of sensitive receptors.
- The prohibition of locating staging and queuing areas within 1,000 feet of sensitive receptors.
- The use of electrified equipment when feasible.
- The substitution of gasoline-powered in place of diesel-powered equipment, where feasible.
- The use of alternatively fueled construction equipment on-site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel.
- The requirement that contractors repower equipment with the cleanest engines available.
- The requirement that construction equipment use installed California Verified Diesel Emission Control Strategies. These strategies are listed at: <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>
- The requirement that the contractor prepare a dust control plan when the disturbed area is more than one (1) acre.
- The reduction of the amount of disturbed areas where possible.
- The use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site, and the requirement to increase watering frequency whenever wind speeds exceed 15 mph, using reclaimed (non-potable) water whenever possible.
- The spraying of all dirt stock-pile areas daily as needed.
- The requirement that all roadways, driveways, sidewalks, etc. be paved as soon as possible, with building pads laid as soon as possible after grading unless seeding or soil binders are used.
- The requirement to show all fugitive dust mitigation measures on grading and building plans.
- The requirement that the contractor or builder designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent opacity, and prevent transport of dust offsite.

Furthermore, all development projects in Rio Vista are subject to YSAQMD rules and regulations adopted to reduce air pollutant emissions. As just described, proposed General Plan Update Policy OSC-13 would require application of the analysis methods and significance thresholds recommended by the YSAQMD to

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adopted in 1994 for engines over 50 horsepower and were phased in from 1996 to 2000. In 1996, a Statement of Principles pertaining to off-road diesel engines was signed between the EPA, CARB, and engine makers (including Caterpillar, Cummins, Deere, Detroit Diesel, Deutz, Isuzu, Komatsu, Kubota, Mitsubishi, Navistar, New Holland, Wis-Con, and Yanmar). On August 27, 1998, the EPA signed the final rule reflecting the provisions of the Statement of Principles. The 1998 regulation introduced Tier 1 standards for equipment under 50 horsepower and increasingly more stringent Tier 2 and Tier 3 standards for all equipment with phase-in schedules from 2000 to 2008. As a result, all off-road, diesel-fueled construction equipment manufactured in 2006 or later has been manufactured to Tier 3 standards. On May 11, 2004, the EPA signed the final rule introducing Tier 4 emission standards, which are currently phased-in over the period of 2008-2015. The Tier 4 standards require that emissions of PM and NOx be further reduced by about 90 percent. All off-road, diesel-fueled construction equipment manufactured in 2015 or later will be manufactured to Tier 4 standards.

determine a future project's air quality impacts. YSAQMD Rule 2.3, *Visible Emissions*, states that no person shall discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three (3) in any one (1) hour which is: a.) As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or b.) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described above. Rule 2.5, *Nuisance*, states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause to have a natural tendency to cause injury or damage to businesses or property. Rule 2.14, *Architectural Coating*, requires a limit on the quantity of volatile organic compounds in architectural coating supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the county. Rule 2.19, *Fugitive Dust*, requires the reduction of the amount of particulate matter entrained in the ambient air, or discharge into the ambient air, as a result of anthropogenic (manmade) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions.

While the YSAQMD has promulgated methodology protocols for the preparation of air quality analyses, and future development projects allowed under the proposed General Plan Update that are projected to exceed YSAQMD significance thresholds are required to implement mitigation measures in order to reduce air pollutant emissions as much as feasible, YSAQMD significance thresholds may still be exceeded as a result of construction activities allowed under the proposed General Plan Update. Since it cannot be guaranteed that construction of future projects allowed under the proposed General Plan Update would generate air pollutant emissions below YSAQMD significance thresholds due to the programmatic and conceptual nature of the proposed General Plan Update and uncertainties related to future individual projects, this is considered a significant impact. As such, due to nonattainment status for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>, construction activities associated with implementation of the General Plan Update may result in adverse air quality impacts to surrounding land uses and may contribute to the existing air quality condition in the City. The General Plan Update has been prepared to include policies and actions to address and mitigate impacts at the plan level. Policies included in the General Plan Update would reduce emissions from construction. For instance, implementation of Policy OSC-13 could reduce emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> associated by most future construction activities to a less-than-significant level through compliance with YSAQMD's recommended thresholds and application of applicable mitigation measures. Proposed General Plan Update Policy OSC-13 would additionally reduce future construction emissions under the proposed General Plan by requiring construction contractors to utilize Tier 4 engines and exhaust filters, which significantly reduce NO<sub>x</sub>, ROG, PM<sub>10</sub> and PM<sub>2.5</sub> emissions, when necessary to reduce projected construction emissions to levels below significance thresholds. However, at this programmatic stage, the City cannot guarantee that implementing these measures would be sufficient to fully mitigate construction emissions for all projects in all scenarios. There are no additional plan-level measures available that would address this impact. For the vast majority of development projects implemented under the General Plan Update, compliance with existing state and federal regulations, as well as compliance with proposed General Plan Update policies and actions would minimize potential adverse air emissions; however, due to the level of uncertainty regarding the specific project types and the lack of detailed development plans at this

programmatic level of analysis, it cannot be concluded that all impacts would be minimized in a manner consistent with YSAQMD's guidance. Individual projects under the General Plan Update may involve unusual use types, locations, or design features that cannot be anticipated at this city-wide planning stage. Additional measures to minimize unique, project-specific impacts may be able to be identified at the time of environmental review for these individual projects; however, the measures cannot be identified at this time, nor can the City guarantee that such measures will, in fact, be available and feasible for all project scenarios.

Impacts due to construction emissions would be significant.

### **2.3.3.2 Project Operations Criteria Air Quality Emissions**

The proposed General Plan Update would accommodate new development that would operate through the planning horizon year. New residential, commercial, industrial, and recreational development facilitated by the proposed General Plan Update would result in long-term area-, energy-, and mobile-source emissions. Area source emissions are the combination of many small emission sources that include use of outdoor landscape maintenance equipment, use of consumer products such as cleaning products, use of fireplaces and hearths, and periodic reapplication of architectural coatings. Criteria pollutants generated from energy sources are principally from the onsite use of natural gas and other heating fuels; electricity consumption is not included in energy source emissions as those potential emissions would be generated as the result of the operation of an electricity generation facility which may or may not be within the same air basin and under the same attainment status as the end-use. Mobile source emissions result from the vehicle activity associated with the operation of a given land use development project. It should be noted that the proposed General Plan Update would not itself authorize specific development to occur within the City. Future development projects would be subject to the City's standard CEQA review process and would be required to assess project-specific emissions in relation to the YSAQMD significance thresholds. Although specific project-level information for potential future development is not available at this time and the estimation of emissions resulting from future development would be speculative, anticipated average daily emissions were quantified and presented in Table 2-6 in order to provide an estimate of the potential overall area, energy, and mobile source emissions resulting from the proposed General Plan Update based on the calculation methodology provided in Section 2.3.2, Methodology.

<b>Table 2-6. Operational Criteria Air Pollutant Emissions</b>						
<b>Emission Source</b>	<b>Pollutant</b>					
	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>SO<sub>2</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b><i>Proposed General Plan Update Buildout Daily Emissions (Pounds per Day)</i></b>						
Mobile	979.00	1,143.00	7,109.00	22.40	142,855.00	14,562.00
Area	1,318.00	15.50	1,808.00	0.10	2.68	2.02
Energy	18.10	326.00	253.00	1.97	25.00	25.00
<b>Total</b>	<b>2,315.10</b>	<b>1,484.50</b>	<b>9,170.00</b>	<b>24.47</b>	<b>142,882.68</b>	<b>14,589.02</b>
<i>YSAQMD Significance Threshold</i>	-	-	-	-	80 pounds/day	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b><i>Proposed General Plan Update Buildout Total Annual Emissions (Tons per Year)</i></b>						
Mobile	134.00	152.00	886.00	2.86	18,496.00	1,887.00
Area	216.00	1.40	163.00	0.01	0.24	0.18
Energy	3.30	59.40	46.20	0.36	4.56	4.56
<b>Total</b>	<b>353.30</b>	<b>212.80</b>	<b>1,095.20</b>	<b>3.23</b>	<b>18,500.80</b>	<b>1,891.74</b>
<i>YSAQMD Significance Threshold</i>	10 tons/year	10 tons/year	-	-	-	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
<b><i>Existing General Plan 2001 Buildout Daily Emissions (Pounds per Day)</i></b>						
Mobile	969.00	1,587.00	6,963.00	18.80	85,349.00	8,712.00
Area	853.00	10.10	1,156.00	0.07	1.75	1.32
Energy	12.70	230.00	180.00	1.39	17.60	17.60
<b>Total</b>	<b>1,834.70</b>	<b>1,827.10</b>	<b>8,299.00</b>	<b>20.26</b>	<b>85,368.35</b>	<b>8,730.92</b>
<i>YSAQMD Significance Threshold</i>	-	-	-	-	80 pounds/day	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b><i>Existing General Plan 2001 Buildout Total Annual Emissions (Tons per Year)</i></b>						
Mobile	129.00	206.00	882.00	2.43	10,962.00	1,120.00
Area	140.00	0.91	104.00	0.01	0.16	0.12
Energy	3.32	41.90	32.80	0.25	3.21	3.21
<b>Total</b>	<b>272.32</b>	<b>248.81</b>	<b>1,018.80</b>	<b>2.69</b>	<b>10,965.37</b>	<b>1,123.33</b>
<i>YSAQMD Significance Threshold</i>	10 tons/year	10 tons/year	-	-	-	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

<b>Table 2-6. Operational Criteria Air Pollutant Emissions</b>						
<b>Emission Source</b>	<b>Pollutant</b>					
	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>SO<sub>2</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b><i>Daily Emissions (Pounds per Day) Difference</i></b>						
Mobile	+10.00	-444.00	+146.00	+3.60	+57,506.00	+5,850.00
Area	+465.00	+5.40	+652.00	+0.03	+0.93	+0.70
Energy	+5.40	+96.00	+73.00	+0.58	+7.40	+7.40
<b>Total</b>	<b>+480.40</b>	<b>-342.60</b>	<b>+871.00</b>	<b>+4.21</b>	<b>+57,514.33</b>	<b>+5,858.10</b>
<i>YSAQMD Significance Threshold</i>	-	-	-	-	80 pounds/day	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b><i>Total Annual Emissions (Tons per Year) Difference</i></b>						
Mobile	+5.00	-54.00	+4.00	+0.43	+7,534.00	+767.00
Area	+76.00	+0.49	+59.00	0.00	+0.08	+0.06
Energy	-0.02	+17.50	+13.40	+0.11	+1.35	+1.35
<b>Total</b>	<b>+80.98</b>	<b>-36.01</b>	<b>+76.40</b>	<b>+0.54</b>	<b>+7,535.43</b>	<b>+768.41</b>
<i>YSAQMD Significance Threshold</i>	10 tons/year	10 tons/year	-	-	-	-
<b>Exceed YSAQMD Daily Threshold?</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

Source: CalEEMod version 2022.1.1.28 Refer to Attachment A and Attachment B for Model Data Outputs.

Notes: Emission projections predominately based on CalEEMod model defaults for Solano County, site acreage provided by the City, and median building square footage and dwelling units allowed per information the City's General Plan Land Use Element.

As shown by Table 2-6, all criteria air pollutant emissions projected to be generated at buildout of the proposed 2045 General Plan Update would be higher than projected emissions at existing General Plan 2001 buildout, with the exception of NO<sub>x</sub> emissions. NO<sub>x</sub> emissions would be higher under the existing General Plan 2001 buildout. This is because buildout of the existing General Plan 2001 would accommodate a greater amount of industrial land use acreage, a source of heavy-duty trucks. Heavy-duty trucks are a potent source of NO<sub>x</sub> compared with other vehicles and the reduction of industrial land use acreage under the proposed General Plan would instigate fewer heavy-duty truck trips in the city and therefore less NO<sub>x</sub> emissions. Buildout of the proposed 2045 General Plan Update would allow for an additional 3,022 residential units, an additional 113 acres of mixed-use space and an additional 18 acres of retail spaces compared with the existing General Plan 2001 buildout and the more typical fleet mix associated with these land uses would result in increases of the other pollutants.

The General Plan Update does propose several policy provisions that would assist to reduce the generation of criteria air pollutants from mobile sources, the highest emitter of criteria air pollutants. For instance, proposed Land Use and Community Character Element Policy LU-1 seeks the development of compact, complete residential neighborhoods by encouraging the location of services and amenities within walking

and biking distance of residences. Policy LU-3 would encourage new residential development to incorporate design features that promote walking and connectivity between blocks and adjacent neighborhoods and in a similar context, Policy LU-6 would encourage development in the North Waterfront District to be a mix of uses including residential, commercial, and public park space along the waterfront. Proposed Policy LU-9 would promote pedestrian-oriented retail and mixed-use development in Neighborhood Mixed Use, Downtown, and the Waterfront areas. The promotion of mixed-use development contributes to less dependency on automobiles, a source of criteria air pollutants. Mobility and Circulation Element Policies MC-2, MC-4, and MC-14 proposes to promote the development of bikeways, sidewalks, pedestrian pathways, and multi-use paths that connect residential neighborhoods with other neighborhoods, schools, employment centers, commercial centers and public open space, and that separate bicyclists, skateboarders, and pedestrians from vehicular traffic whenever possible. Proposed Policy MC-15 seeks to ensure that bicycle and pedestrian facilities follow logical routes providing connections between transportation nodes and land uses, including bicycle and pedestrian connections to transit stops, buses that can accommodate bicycles, and park-and-ride lots, so that the pedestrian facilities serve the transportation needs of residents, and are not constructed as “sidewalks to nowhere.” Further, Policy MC-16 seeks to ensure that the City’s circulation network will accommodate all anticipated and potential modes of transportation, including small personal electric vehicles ranging in size up to golf carts. Additionally, Parks & Recreation Policy PR-9 proposes to create an integrated trail, bikeway, and open space network within the City that links parks and recreation areas, schools, downtown, the waterfront, and residential neighborhoods.

Development projects accommodated by the proposed General Plan would be analyzed on a case-by-case basis when detailed information regarding operational activities is known and, where applicable, projects will be required to implement mitigation to reduce operational emissions. Future projects would be subject to the proposed General Plan Update policies identified above, as well as YSAQMD and State rules and regulations, including, but not limited to those identified in Section 2.2, Regulatory Framework. Nonetheless, due to the uncertainties discussed above, the reductions that may be achieved through implementation of General Plan Update policies cannot be assumed to be sufficient to reduce operational emissions to meet the YSAQMD’s thresholds for all projects and in instances where concurrent projects may combine to exceed thresholds. Therefore, emissions associated with the Project could exceed the YSAQMD significance thresholds. The Project has been designed to include policies and actions to address and mitigate impacts. Policies included in the General Plan Update would reduce emissions of criteria air pollutants in Rio Vista but cannot be assumed to be sufficient to reduce operational emissions to meet the YSAQMD thresholds. There are no additional plan-level measures available that would reduce impacts from long-term operational-related emissions. All feasible operational emissions reduction measures have been incorporated into the General Plan Update through the inclusion of the policies discussed above. There could be additional project-specific mitigation measures applied to specific future development allowed under the General Plan Update to reduce long-term operational-generated emissions of air pollutants to levels below the YSAQMD’s thresholds of significance. However, the nature, feasibility, and effectiveness of such project-specific mitigation cannot be determined at this time. As such, the City cannot assume that mitigation would be available and implemented such that all future operational-related emissions of air pollutants would be reduced to less-than-significant levels. Furthermore, as shown by Table 2-6 all criteria air pollutant emissions at buildout of the proposed 2045 General Plan Update, with the exception of NOx,

would be higher than projected emissions at existing General Plan 2001 buildout. As such, this impact is significant.

### **2.3.3.3 Project Consistency with Air Quality Planning**

As part of its enforcement responsibilities, the USEPA requires each state with nonattainment areas to prepare and submit a SIP that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the CCAA requires an air quality attainment plan to be prepared for areas designated as nonattainment regarding the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

As previously described, the YSAQMD is the agency responsible for enforcing many federal and State air quality requirements and for establishing air quality rules and regulations. The YSAQMD attains and maintains air quality conditions in Solano County. They achieve this through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. As part of this effort, the YSAQMD has developed input to the SIP. The 2017 Sacramento Regional 2008 8-Hour Ozone Attainment and Reasonable Further Progress Plan (including 2018 updates), the PM<sub>10</sub> Implementation/Maintenance Plan and Re-Designation Request (2010), and PM<sub>2.5</sub> Implementation/Maintenance Plan and Re-designation Request for Sacramento PM<sub>2.5</sub> Nonattainment Area (2013) constitute the current SIP for Solano County and include the YSAQMD's plans and control measures for attaining air quality standards. These air quality attainment plans are a compilation of new and previously submitted plans, programs (e.g., monitoring, modeling, permitting), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards.

The proposed 2045 General Plan Update and associated policy provisions support the air quality planning efforts of the YSAQMD, as they include applicable pollutant control mechanisms. For instance, the General Plan Update promotes compact, mixed-use development patterns that reduce the need for automobile travel, and thus reduce criteria air pollutants. It is noted that an additional 113 acres of mixed-use space is proposed in the 2045 General Plan Update. Further, Land Use and Community Character Element Implementation Program LU-4 incentivizes development on underutilized land, which minimizes sprawl and shortens commuting distances, indirectly reducing VMT and thereby reducing criteria air pollutants. The proposed General Plan Update seeks to reduce the environmental impact (including air quality) of land use development by increasing the viability of walking, biking, and transit. The proposed General Plan Update supports the development of projects that facilitate and enhance the use of alternative modes of transportation, including pedestrian-oriented retail and activity centers and dedicated bicycle lanes and paths. For example, proposed Land Use and Community Character Element Policy LU-1 seeks the development of compact, complete residential neighborhoods by encouraging the location of services and amenities within walking and biking distance of residences. Policy LU-3 would encourage new residential development to incorporate design features that promote walking and connectivity between blocks and adjacent neighborhoods and in a similar context, Policy LU-6 would encourage development in the North

Waterfront District to be a mix of uses including residential, commercial, and public park space along the waterfront. Proposed Policy LU-9 would promote pedestrian-oriented retail and mixed-use development in Neighborhood Mixed Use, Downtown, and the Waterfront areas. The Mobility and Circulation Element focuses on enhancing active transportation infrastructure, such as bicycle lanes and pedestrian pathways, and supports alternatives to single-occupancy vehicle trips. Additionally, this Element of the proposed General Plan Update seeks to collaborate with regional entities like the Solano Transportation Authority with the intent of improving public transit access and reducing vehicular reliance, thus reducing criteria air pollutants. By improving public transit options, the proposed General Plan aims to shift commuters from private vehicles to mass transit, reducing congestion and emissions. The Open Space and Resource Conservation Element integrates air quality considerations in the conservation of natural resources. The policy provisions in this element emphasize reducing emissions through energy efficiency in new developments and preserving open spaces, which serve as carbon sinks. Additionally, this Element encourages urban greening, such as tree planting, which directly contributes to mitigating urban heat islands and improving air quality. Most importantly, Open Space and Resource Conservation Element Policy OSC-13 requires coordination with the YSAQMD, ensuring that the majority of development projects adhere to emissions reduction targets and other air quality regulations.

These proposed policy provisions demonstrate the General Plan's alignment with the YSAQMD's goals to improve air quality by reducing vehicular emissions, supporting sustainable development, and enhancing green infrastructure. The policies and programs of the proposed General Plan Update collectively create a framework for Rio Vista to grow in a manner that actively supports air quality improvements by reducing emissions from transportation, encouraging sustainable land use, and integrating green infrastructure. The proposed General Plan Update is consistent with YSAQMD's air quality planning efforts and the Project would not conflict with or obstruct implementation of YSAQMD's air quality plans.

#### **2.3.3.4 Exposure of Sensitive Receptors to Toxic Air Contaminants**

As previously described, sensitive receptors are defined as 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 of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over age 65, children under age 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

According to California's SB 535, the City of Rio Vista is considered a disadvantage community due to its designation as such based on the CalEnviroScreen tool, described in detail in Section 2.2.2.10, *CalEnviroScreen and Disadvantaged Communities (Senate Bill 535)*, which identifies areas disproportionately burdened by environmental pollution and other factors impacting public health, meaning that residents of Rio Vista are likely to experience higher levels of environmental hazards compared to other communities in California.

### Construction-Generated Air Contaminants

Construction of the Project would result in temporary emissions of ROG, NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and the TAC, DPM. As previously described, TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. Sources of the TAC, DPM, during construction activities include off-road construction vehicle and equipment use and on-road vehicle use for material and soil hauling. For construction activity, DPM is the primary TAC of concern. Identification of potential impacts to sensitive receptors resulting from individual project-generated TACs would require project-specific information for future individual land use development projects that is not currently known. Therefore, assessment of future development projects facilitated by the proposed General Plan Update that would be subject to CEQA would undergo their own review of potential construction-related localized impacts and identify appropriate and feasible mitigation to implement to reduce potentially significant impacts. The amount to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (CARB 2005). In the case of most construction projects allowed under the proposed 2045 General Plan Update, duration would be short term, lasting less than one year. Construction-generated DPM emissions contribute to negative health impacts when construction is extended over lengthy periods of time. The use of diesel-powered construction equipment during construction would be temporary and episodic and would occur over several locations isolated from one another. Furthermore, future development allowed under the proposed 2045 General Plan Update would be subject to and would comply with California regulations limiting idling to no more than 5 minutes, which would further reduce nearby sensitive receptors exposure to temporary and variable diesel PM emissions. Many of the individual construction projects would span small areas. Construction projects contained in a site of less than 5 acres are generally considered to represent less than significant health risk impacts due to (1) limitations on the off-road diesel equipment able to operate and thus a reduced amount of generated diesel PM, (2) the reduced amount of dust-generating ground disturbance possible compared to larger construction sites, and (3) the reduced duration of construction activities compared to the development of larger sites. For these reasons and because diesel fumes disperse rapidly over relatively short distances, DPM generated by most construction activities, in and of itself, would not be expected to create conditions where the probability of contracting cancer is greater than 10 in one million for nearby receptors.

Implementation of Policy OSC-13 could reduce emissions of DPM associated by most future construction activities to a less-than-significant level through compliance with YSAQMD's recommended thresholds and application of applicable mitigation measures, such as the requirement to utilize Tier 4 engines and exhaust filters, which significantly reduce DPM emissions, when necessary to reduce projected construction emissions to levels below significance thresholds. Implementation of appropriate YSAQMD-recommended pollutant reduction measures would reduce construction emissions for future individual development projects; however, because individual project-specific information is not available, it is not possible to determine whether implementation of the YSAQMD reduction measures would reduce health risk-related impacts to sensitive receptors or identify additional quantifiable mitigation measures that would reduce project-specific construction emissions to ensure that localized emissions generated during construction of

future development projects under the General Plan Update do not expose sensitive receptors to substantial pollutant concentrations. As such, the following mitigation is recommended.

Mitigation Measure

**MM AQ-1** The following will be added as policies to the Open Space and Resource Conservation Element of the 2045 General Plan:

NEW POLICY: In the case when a subsequent project's construction span is greater than 5 acres and/or is scheduled to last more than two years, the subsequent project applicant shall be required to prepare a site-specific construction pollutant mitigation plan in consultation with City of Rio Vista Planning staff prior to the issuance of grading permits. A project-specific construction-related dispersion modeling acceptable to the Yolo Solano Air Quality Management District (YSAQMD) shall be used to identify potential toxic air contaminant impacts, including diesel particulate matter. If YSAQMD 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 and that the measures reduce the health risk below YSAQMD risk thresholds. Construction pollutant mitigation plan measures shall include but not be limited to:

1. Limiting the amount of acreage to be graded in a single day.
2. Restricting intensive equipment usage and intensive ground disturbance to hours outside of normal school hours.
3. Notifying affected sensitive receptors one week prior to commencing on-site construction so that any necessary precautions (such as rescheduling or relocation of outdoor activities) can be implemented. The written notification shall include the name and telephone number of the individual empowered to manage construction of the project. In the event that complaints are received, the individual empowered to manage construction shall respond to the complaint within 24 hours. The response shall include identification of measures being taken by the project construction contractor to reduce construction-related air pollutants. Such a measure may include the relocation of equipment.

Mitigation measure AQ-1 requires a site-specific analysis of large-scale construction projects (greater than 5 acres lasting longer than two years) for the potential for construction-generated air pollutant impacts based on specific project details of future development, and the development of adequate mitigation, consistent with YSAQMD methodologies and protocols, to address any such impacts. As a result, implementation of these mitigation measures would reduce the impact.

Operational Air Contaminants

Common sources of operational TAC emissions are stationary sources (e.g., diesel backup generators and gasoline stations), which are subject to YSAQMD permit requirements. Another common and often more significant source type is on-road motor vehicles on high-volume roads, such as SR-12. As previously described, CARB developed and approved the Air Quality and Land Use Handbook: A Community Health Perspective (2005) to address the siting of sensitive land uses in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources. CARB's recommendations on the siting of new sensitive land uses identified in Table 2-4 above were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources.

As a planning document, the proposed General Plan Update identifies land use designations within the City Boundary, Sphere of Influence, and Planning Area that specify the type of allowed uses associated with each designation. While the proposed General Plan Updated does not propose site-specific development, its policies establish a framework to minimize TAC exposure risks through careful land use planning. Key characteristics include the fact that Rio Vista already hosts sensitive land uses such as residential neighborhoods, schools, and healthcare facilities, and the proposed General Plan Update anticipates the addition of new sensitive land uses (primarily residential) during implementation but incorporates safeguards to minimize exposure risks. Compared to the existing 2001 General Plan, the proposed General Plan Update reduces allowable industrial development by 130 acres. This shift demonstrates a deliberate effort to mitigate potential conflicts between industrial TAC sources and sensitive receptors.

The General Plan requires industrial uses to be located away from sensitive land uses like residences. By prohibiting heavy industrial activities near residential areas, schools, and healthcare facilities, the proposed General Plan Update minimizes potential exposure to high concentrations of TACs. For example, proposed Land Use and Community Character Element Policy LU-7 explicitly emphasizes that new developments must be compatible with surrounding uses. This ensures that sensitive receptors like schools, homes, or healthcare facilities are not situated near significant TAC sources, such as heavy manufacturing facilities or distribution centers. The proposed General Plan Update also contains policy provisions that are generally consistent with the CARB Air Quality and Land Use Handbook. For example, The General Plan Land Use Element would require the location of industrial and commercial land uses away from noise-sensitive land uses, which also includes TAC-sensitive land uses such as residences, thereby prohibiting the development of any substantial commercial or industrial source of TAC emissions in the vicinity of residential land uses. Additionally, the Land Use Element states that to protect existing industry and commercial businesses, new sensitive land uses shall not be placed near existing noise generating uses, which often consist of sources of TAC emissions such as industrial facilities, thereby prohibiting the development of TAC-sensitive land uses in the vicinity of most sources of stationary TAC sources.

These proposed policies of the General Plan Update effectively assist to reduce human health impacts and exposure of sensitive receptors to substantial pollutant concentrations including, the requirement new developments to be compatible with existing uses, preventing land use conflicts. The proposed General Plan Update generally aligns with CARB guidelines to maintain safe distances between sensitive land uses

and major TAC sources, and further reduces industrial land use acreage, decreasing the overall potential for stationary TAC sources. Given these proactive measures, the General Plan Update demonstrates a strong framework for managing TAC-related health risks.

### **2.3.3.5 Odors**

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Construction activities that have the potential to emit odors from the operation of diesel equipment, generation of fugitive dust, and paving (asphalt). Odors and similar emissions from construction would be intermittent and temporary, and generally would not extend beyond the construction area. While odors could be generated during construction activities, the proposed General Plan Update would not directly result in construction of any development project. Identification of potential impacts to odor receptors resulting from construction-generated odors, such as equipment exhaust, would require project-specific information for future individual land use development projects that is not currently known. Nonetheless, odors generated from the operation of diesel equipment are short-term in nature and rapidly dissipate and be diluted by the atmosphere downwind of the odor sources. Additionally, odors would be localized and generally confined to the construction area. Therefore, construction odors generated under the General Plan Update would not adversely affect a substantial number of people to odor emissions.

According to the YSAQMD CEQA Handbook (2007), facilities/land uses that have the potential to produce odors during standard operations and may require special attention in the environmental review process include the following:

- Wastewater Treatment Plants
- Sanitary Landfills
- Composting/Green Waste Facilities
- Recycling Facilities
- Chemical Manufacturing Plants
- Painting/Coating Operations
- Agricultural Operations
- Slaughterhouse/Food Packaging Plants

Per the YSAQMD (2007), if a land use project proposes any of the above type of land uses, which have the potential to cause significant odor impacts, the odor impacts should be identified and discussed in the environmental document so mitigation measures may be identified. These guidelines further state that the most effective mitigation strategy is to provide a sufficient distance, or buffer zone, between the source and the receptor(s). The greater the distance between an odor source and receptor, the less odor impact when it reaches the receptor. The YSAQMD CEQA Handbook (2007) recommends a buffer distance of one mile between odor sources like those listed above and sensitive receptors. Consideration of YSAQMD's recommended buffer distances would be required for all future development under the proposed General Plan Update, which requires incorporation, as conditions of approval, of YSAQMD-recommended mitigation measures (see General Plan Update Policy OSC-13). Additionally, the City Municipal Code also addresses potential odor impacts by requiring that no emission of odorous gases or other odorous matter be permitted in excess of the most recent standards adopted by the YSAQMD and Solano County Department of Environmental Health. Any process which may involve the creation or emission of any odor shall be provided with a secondary safeguard system so that control will be maintained if the primary safeguard system should fail. Lastly, YSAQMD Rule 2.5, *Nuisance*, states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause to have a natural tendency to cause injury or damage to businesses or property. These existing requirements would minimize odor emissions from adversely affecting a substantial number of people within the City, and impacts would be less than significant.

### **2.3.3.6 Cumulative Air Quality Impacts**

The cumulative area of analysis is the SVAB, which includes Rio Vista. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively

significant adverse air quality impacts. Furthermore, per YSAQMD guidance, projects that would individually have a significant air quality impact would also be considered to have a significant cumulative impact. Thus, the impacts previously discussed are evaluated in the cumulative context and no additional cumulative analysis is needed.

In summary, the proposed General Plan Update is expected to generate construction and operational emissions that would exceed YSAQMD thresholds. Additionally, buildout of the proposed General Plan would result in an increase of emissions compared with buildout of the existing General Plan, with the exception of NO<sub>x</sub> emissions. Implementation of proposed General Plan Policies and YSAQMD-recommended mitigation measures would reduce construction and operational emissions for future projects under the proposed General Plan Update; however, due to the programmatic nature of this Draft EIR, it cannot be determined whether this would reduce emissions below the specified thresholds during construction or operation. Thus, Project impacts are cumulatively considerable.

### Health Effects

The City of Rio Vista, within the SVAB, is designated as nonattainment with respect to the NAAQS and CAAQS for ROG and NO<sub>x</sub>, which are precursors to ozone. The health effects associated with O<sub>3</sub> are generally associated with reduced lung function. The contribution of reactive organic gases and NO<sub>x</sub> to regional ambient O<sub>3</sub> concentrations is the result of complex photochemistry. The increases in O<sub>3</sub> concentrations in the SVAB due to O<sub>3</sub> precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. Further, the potential for exacerbating excessive O<sub>3</sub> concentrations would also depend on the time of year that the ROG emissions would occur, because exceedances of the O<sub>3</sub> NAAQS and CAAQS tend to occur between April and October when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry and the difficulty in connecting small amounts of pollution to generalized health outcomes, the holistic effect of a single project's emissions of O<sub>3</sub> precursors on health impacts is hard to predict. The effect of a single project's emissions of O<sub>3</sub> precursors is speculative due to the lack of quantitative methods to assess this impact.

The Rio Vista region is also designated as nonattainment with respect to the NAAQS for PM<sub>2.5</sub> and nonattainment with respect to the CAAQS for PM<sub>10</sub>. Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. While PM<sub>10</sub> and PM<sub>2.5</sub> contribute to overall air quality concerns, these pollutants are highly localized. PM concentrations decrease rapidly with distance from the source due to dispersion and gravitational settling, and thus regional air quality averages do not capture the localized nature of PM emissions. For these reasons, the effect of a single project's PM emissions, in combination with other projects and sources spanning the SVAB and Rio Vista region, is speculative.

While it is not possible to determine whether implementation of the YSAQMD reduction measures would reduce health risk-related impacts to sensitive receptors or identify additional quantifiable mitigation measures that would reduce project-specific construction emissions to ensure that localized emissions

generated during construction of future development projects under the General Plan Update do not expose sensitive receptors to substantial pollutant concentrations, proposed policies of the General Plan Update would effectively reduce human health impacts and exposure of sensitive receptors to substantial pollutant concentrations during the operations of these future development projects.

There are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days, and there are currently no modeling tools that can provide reliable and meaningful additional information regarding health effects from criteria air pollutants generated by individual projects within YSAQMD's jurisdiction. Currently, YSAQMD, CARB, and the USEPA have not approved a quantitative method to reliably, meaningfully, and consistently translate the mass emission estimates for the criteria air pollutants resulting from the 2045 General Plan Update to specific health effects.

In summary, compliance with the required 2045 General Plan policies along with the implementing action aimed at reduction of construction and operational criteria air pollutant emissions would help reduce impacts associated with buildout of the 2045 General Plan. Future projects under the 2045 General Plan would comply with applicable YSAQMD rules and regulations in order to meet YSAQMD significance thresholds, as required under Policy OSC-13, which are based on levels that the SVAB can accommodate without affecting the attainment date for both the federal and State AAQS, that has been established to protect public health and welfare. Therefore, the 2045 General Plan would result in less-than-significant health effects associated with criteria air pollutants.

Overall however, cumulative impacts to air quality are considered significant.

### 3.0 GREENHOUSE GAS EMISSIONS

This section presents a summary of regulations applicable to greenhouse gas (GHG) emissions; a summary of climate change science and GHG sources in California; quantification of project-generated GHGs and discussion about their contribution to global climate change; and analysis of the project's resiliency to climate change-related risks. In addition, mitigation measures are recommended to reduce the project's contribution to climate change.

#### 3.1 Greenhouse Gas Setting

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state's primary GHG emissions reduction programs. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of increased warming of the earth's climate, known as global climate change or global warming.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors together (Intergovernmental Panel on Climate Change [IPCC] 2023).

Table 3-1 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare each GHG's ability to trap heat in the atmosphere relative to another gas. The reference gas used is CO<sub>2</sub>; therefore, GWP-weighted emissions are measured in metric tons (MT) of CO<sub>2</sub> equivalent

(CO<sub>2</sub>e). Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH<sub>4</sub> traps over 27 times more heat per molecule than CO<sub>2</sub>, and N<sub>2</sub>O absorbs 273 times more heat per molecule than CO<sub>2</sub> (IPCC 2023). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO<sub>2</sub>e), which weight each gas by its global warming potential. Expressing GHG emissions in CO<sub>2</sub>e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted.

<b>Greenhouse Gas</b>	<b>Description</b>
CO <sub>2</sub>	Carbon dioxide is a colorless, odorless gas. CO <sub>2</sub> is emitted in a number of ways, both naturally and through human activities. The largest source of CO <sub>2</sub> emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO <sub>2</sub> emissions. The atmospheric lifetime of CO <sub>2</sub> is variable because it is so readily exchanged in the atmosphere. <sup>1</sup>
CH <sub>4</sub>	Methane is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH <sub>4</sub> to the atmosphere. Natural sources of CH <sub>4</sub> include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH <sub>4</sub> is about 12 years. <sup>2</sup>
N <sub>2</sub> O	Nitrous oxide is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N <sub>2</sub> O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N <sub>2</sub> O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N <sub>2</sub> O is approximately 120 years. <sup>3</sup>

Sources: (1) USEPA 2023a; (2) USEPA 2023b; (3) USEPA 2023c

Climate change refers to any significant change in measures of climate (e.g., temperature, precipitation, or wind patterns) lasting for an extended period of time (i.e., decades or longer). The Earth’s temperature depends on the balance between energy entering and leaving the planet’s system, and many factors (natural and human) can cause changes in Earth’s energy balance. The greenhouse effect is the trapping and buildup of heat in the atmosphere near the Earth’s surface (the troposphere). The greenhouse effect is a natural process that contributes to regulating the Earth’s temperature, and it creates a livable environment on Earth.

Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that is absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth’s surface temperature to rise. Global climate change is a cumulative impact; a project contributes to this impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008).

### **3.1.1 Sources of Greenhouse Gas Emissions**

In 2024, CARB released the 2024 edition of the California GHG Emissions from 2000 to 2022: trends of Emissions and Other Indicators report. In 2022, California emitted 371.1 million metric tons of CO<sub>2</sub>e. This inventory is 2.4 percent lower than in 2021. The 2022 emissions data shows that the State of California is continuing its established long-term trend of GHG emission declines, despite the anomalous emissions trends from 2019 through 2021, due in large part to the impacts of the COVID-19 pandemic. Overall trends in the Inventory continue to demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross state product (GSP) is declining. California's GSP increased by 0.7 percent in 2022, and emissions per GSP declined by 3.1 percent from 2021 to 2022. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2022, accounting for approximately 37.7 percent of total GHG emissions in the state. Transportation emissions have decreased 3.6 percent from 2021 levels due to reductions from on-road, rail and, to a lesser extent, intrastate aviation transportation. Emissions from the electricity sector account for 16.1 percent of the Inventory, which is a decrease of 4.1 percent since 2021, despite the growth of in-state solar, wind, and hydropower energy generation. California's industrial sector accounts for the second largest source of the state's GHG emissions in 2022, accounting for 19.6 percent, which saw a decrease of 2 percent since 2021 (CARB 2024b).

## **3.2 Regulatory Framework**

### **3.2.1 Federal**

#### ***3.2.1.1 Update to Corporate Average Fuel Economy Standard (2017 to 2026)***

The federal government issued new Corporate Average Fuel Economy (CAFE) standards in 2012 for model years 2017 to 2025, which required a fleet average of 54.5 miles per gallon in 2025. However, on March 30, 2020, the USEPA finalized an updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards covering model years 2021 through 2026, known as the Safer Affordable Fuel Efficient (SAFE) Vehicles Final Rule for Model Years 2021 to 2026. Under SAFE, the fuel economy standards will increase 1.5 percent per year compared to the 5.0 percent per year under the CAFE standards established in 2012. Overall, SAFE requires a fleet average of 40.4 miles per gallon for model year 2026 vehicles (85 Federal Register 24174 (April 30, 2020)). On December 21, 2021, under the direction of Executive Order (EO) 13990 issued by President Biden, the National Highway Traffic Safety Administration (NHTSA) repealed SAFE Vehicles Rule Part One, which had preempted state and local laws related to fuel economy standards. In addition, the NHTSA announced new proposed fuel standards on March 31, 2022. Fuel efficiency under the new standards proposed will increase 8.0 percent annually for model years 2024 to 2025 and 10 percent annually for model year 2026. Overall, the new CAFE standards require a fleet average of 49 miles per gallon for passenger vehicles and light trucks for model year 2026, which would be a 10 miles per gallon increase relative to model year 2021 (NHTSA 2022).

### **3.2.2 State**

#### **3.2.2.1 Executive Order S-3-05**

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

#### **3.2.2.2 Executive Order B-55-18**

EO B-55-18 (September 2018) establishes a statewide policy for the state to achieve carbon neutrality as soon as possible (no later than 2045) and achieve and maintain net negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the state’s GHG emissions. CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

#### **3.2.2.3 Assembly Bill 32 Climate Change Scoping Plan and Updates**

In 2006, the California legislature passed Assembly Bill (AB) 32 (Health and Safety Code § 38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 required CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008, which outlined measures to meet the 2020 GHG reduction goals. California exceeded the target of reducing GHG emissions to 1990 levels by the year 2017.

The Scoping Plan is required by AB 32 to be updated at least every five years. The latest update, the 2022 Scoping Plan Update, outlines strategies and actions to reduce greenhouse gas emissions in California. The plan focuses on achieving the state’s goal of reaching carbon neutrality by 2045 and reducing greenhouse gas emissions to 40 percent below 1990 levels by 2030. The plan includes a range of strategies across various sectors, including transportation, industry, energy, and agriculture. Some of the key strategies include transitioning to zero-emission vehicles, expanding renewable energy sources, promoting sustainable land use practices, implementing a low-carbon fuel standard, and reducing emissions from buildings. Additionally, the plan addresses equity and environmental justice by prioritizing investments in communities most impacted by pollution and climate change. The plan also aims to promote economic growth and job creation through the transition to a low-carbon economy.

#### **3.2.2.4 Senate Bill 32 of 2016**

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California’s GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include § 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below

1990 levels by no later than December 31, 2030 (the other provisions of AB 32 remained unchanged). On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provided a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies. The 2017 Scoping Plan also placed an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with Statewide per capita goals of no more than 6 metric tons of CO<sub>2</sub>e by 2030 and 2 metric tons of CO<sub>2</sub>e by 2050.

### **3.2.2.5 Assembly Bill 1279 of 2022**

In September 2022, Governor Brown signed AB 1279, the California Climate Crisis Act, which requires California to achieve carbon neutrality as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. AB 1279 also requires that by 2045 statewide anthropogenic GHG emissions be reduced to at least 85 percent below 1990 levels and directs CARB to ensure that its scoping plan identifies and recommends measures to achieve these goals. AB 1279 also directs CARB to identify policies and strategies to enable carbon capture, utilization, and storage and CO<sub>2</sub> removal technologies to meet emission reduction goals. In addition, CARB is required to submit an annual report on progress in achieving the 2022 Scoping Plan's goals.

In response to the passage of AB 1279 and the identification of the 2045 GHG emissions reduction target, CARB published the Final 2022 Climate Change Scoping Plan in November 2022 (2022 Update). The 2022 Update builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying a new, technologically feasible, cost-effective, and equity-focused path to achieve California's climate target. The 2022 Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon.

The 2022 Update assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan; addresses recent legislation and direction from Governor Newsom; extends and expands upon these earlier plans; and implements a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as well as taking an additional step of adding carbon neutrality as a science-based guide for California's climate work. As stated in the 2022 Update, "the plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the State's natural and working lands and using a variety of mechanical approaches." Specifically, the 2022 Update achieves the following:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.

- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels.
- Focuses on strategies for reducing California’s dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California’s most impacted communities as driving principles throughout the document.
- Incorporates the contribution of natural and working lands to the State’s GHG emissions, as well as their role in achieving carbon neutrality.
- Relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture.
- Evaluates the substantial health and economic benefits of taking action.
- Identifies key implementation actions to ensure success.

In addition to reducing emissions from transportation, energy, and industrial sectors, the 2022 Update includes emissions and carbon sequestration in natural and working lands and explores how they contribute to long-term climate goals. Under the Scoping Plan Scenario, California’s 2030 emissions are anticipated to be 48 percent below 1990 levels, representing an acceleration of the current SB 32 target. Cap-and-trade regulation continues to play a large factor in the reduction of near-term emissions for meeting the accelerated 2030 reduction target. Every sector of the economy will need to begin to transition in this decade to meet these GHG emissions reduction goals and achieve carbon neutrality no later than 2045. The 2022 Update approaches decarbonization from two perspectives, managing a phasedown of existing energy sources and technologies, as well as increasing, developing, and deploying alternative clean energy sources and technology.

### **3.2.2.6 Executive Order N-79-20**

Governor Gavin Newsom signed an executive order on September 23, 2020, that would phase out sales of new gas-powered passenger cars by 2035 with an additional 10-year transition period for heavy vehicles. The State would not restrict used car sales, nor forbid residents from owning gas-powered vehicles, meaning that the overall reduction in GHG emissions would likely not substantially reduce GHG emissions from vehicles for many years after the ban goes into effect.

### **3.2.2.7 Senate Bill 100 of 2018**

In 2018, SB 100 was signed codifying a goal of 60 percent renewable procurement by 2030 and 100 percent by 2045 Renewables Portfolio Standard.

### **3.2.2.8 Senate Bill 1020 of 2022**

SB 1020, the Clean Energy, Jobs, and Affordability Act of 2022, adds interim targets to the policy framework originally established in SB 100 to require renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035 and 95 percent of all retail electricity sales by 2040. Additionally, the bill requires all state agencies to rely on 100 percent renewable energy and zero-carbon resources to serve their own facilities by 2035. This bill also requires that CARB's Scoping Plan workshops be held in non-attainment areas and requires the California Public Utilities Commission, the California Energy Commission, and CARB to create a joint report on electricity reliability.

### **3.2.2.9 Senate Bill 375 of 2008**

The Sustainable Communities and Climate Protection Act of 2008, which became effective in January 2009, helps facilitate AB 32's GHG reduction goals by addressing the emissions from passenger vehicles. The main objectives of the bill aim to reduce GHG emissions through extensive transportation, housing, and land use planning. SB 375 directs CARB to establish regional targets to reduce GHG emissions from passenger vehicle use. CARB administers 2020 and 2035 targets for each of the regions throughout the State. The corresponding metropolitan planning organizations (MPOs) in each region are required to prepare and adopt a Sustainable Communities Strategy (SCS) which help adhere to the CARB administered targets. Sustainable Community Strategies play a vital role in regional transportation plans by allowing transportation, land use, and housing strategies to align with the State's GHG emission goals. Project Plans that are consistent with their region's SCS may be subject to a more streamlined CEQA process.

### **3.2.2.10 Assembly Bill 197 of 2016**

AB 197 is a bill linked to SB 32 and was signed on September 8, 2016. AB 197 prioritizes efforts to cut GHG emissions in low-income or minority communities. AB 197 requires CARB to make available, and update at least annually, the emissions of GHGs, criteria pollutants, and toxic air contaminants for each facility that reports to CARB and air districts. In addition, AB 197 adds two Members of the Legislature to the CARB board as ex officio, non-voting members and creates the Joint Legislative Committee on Climate Change Policies to ascertain facts and make recommendations to the Legislature and the houses of the Legislature concerning the State's programs, policies, and investments related to climate change.

### **3.2.2.11 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings**

The Building and Efficiency Standards (Energy Standards) were first adopted and put into effect in 1978 and have been updated periodically in the intervening years. These standards are a unique California asset that have placed the State on the forefront of energy efficiency, sustainability, energy independence and climate change issues. The 2022 California Building Codes include provisions related to energy efficiency to reduce energy consumption and greenhouse gas emissions from buildings. Some of the key energy efficiency components of the codes are:

1. Energy Performance Requirements: The codes specify minimum energy performance standards for the building envelope, lighting, heating and cooling systems, and other components.
2. Lighting Efficiency: The codes require that lighting systems meet minimum efficiency standards, such as the use of energy-efficient light bulbs and fixtures.
3. HVAC Systems: The codes establish requirements for heating, ventilation, and air conditioning (HVAC) systems, including the use of high-efficiency equipment, duct sealing, and controls.
4. Building Envelope: The codes include provisions for insulation, air sealing, glazing, and other building envelope components to reduce energy loss and improve indoor comfort.
5. Renewable Energy: The codes encourage the use of renewable energy systems, such as photovoltaic panels and wind turbines, to reduce dependence on non-renewable energy sources.
6. Commissioning: The codes require the commissioning of building energy systems to ensure that they are installed and operate correctly and efficiently.

Overall, the energy efficiency provisions of the 2022 California Building Codes aim to reduce the energy consumption of buildings, lower energy costs for building owners and occupants, and reduce the environmental impact of the built environment. The 2022 Building Energy Efficiency Standards improve upon the 2019 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The exact amount by which the 2022 Building Codes are more efficient compared to the 2019 Building Codes would depend on the specific provisions that have been updated and the specific building being considered. However, in general, the 2022 Building Codes have been updated to include increased requirements for energy efficiency, such as higher insulation and air sealing standards, which are intended to result in more efficient buildings. The 2022 standards are a major step toward meeting Zero Net Energy.

### **3.2.3 Local**

#### **3.2.3.1 Yolo-Solano County Air Pollution Control District**

Addressing GHG generation impacts requires an agency to make a determination as to what constitutes a significant impact. The CEQA Guidelines specifically allow lead agencies to determine thresholds of significance that illustrate the extent of an impact and are a basis from which to apply mitigation measures. This means that each agency is left to determine if a project's GHG emissions would have a significant impact on the environment. The guidelines direct that agencies are to use "careful judgment" and "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" the development's GHG emissions (14 CCR Section 15064.4[a]). Determining a threshold of significance for climate change impacts poses a special difficulty for lead agencies. Much of the science in this area is new and is evolving constantly. At the same time, neither the State nor local agencies are specialized in this area, and there are currently no local, regional, or state thresholds for determining whether a residential development has a significant impact on climate change. The CEQA Amendments do not prescribe specific significance thresholds but instead leave considerable discretion to lead agencies to develop appropriate thresholds to apply to projects within their jurisdiction.

The YSAQMD has not adopted thresholds of significance for GHG emissions. In absence of thresholds of significance, this analysis employs the use of the methods and protocols for preparing a plan-level analysis of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is the air quality officer for the San Francisco Bay Area Air Basin, which directly borders the City of Rio Vista. The BAAQMD does not promulgate a plan-level or project-level construction GHG threshold. Thus, this analysis also cites the project-level construction significance threshold established by the Sacramento Metropolitan Air Quality Management District (SMAQMD), the air quality officer for the metropolitan Sacramento region. Both the SMAQMD and BAAQMD have adopted GHG emission thresholds to assist the district in attaining the GHG reduction goals established by AB 32 and SB 32.

The 2017 Scoping Plan also addressed how CEQA can be used to further statewide GHG reduction goals. The Plan recommends GHG reduction goals that can apply to plan- or project-level analyses to be incorporated into environmental documentation in support of CEQA. The Plan states that a per capita GHG target is "appropriate for the plan level (city, county, subregional, or regional level), but not for specific individual projects, because CARB's metric includes all emissions sectors in the State. The BAAQMD states that regional plans, such as the proposed General Plan Update, would have a less than significant impact related to GHG emissions if can be demonstrated that there is no net increase in GHG emissions. To demonstrate no net increase, two comparative analyses should be completed for the projected future emissions:

- Compare the existing (base year) emissions with projected future year emissions plus the regional plan's emissions (base year/regional plan comparison).
- Compare projected future year emissions with projected future year emissions plus the regional plan's emissions (no regional plan/regional plan comparison).

If both comparative analyses demonstrate no net increase in emissions, the GHG impacts of the General Plan Update would be less than significant.

### **3.3 Greenhouse Gas Emissions Impact Assessment**

#### **3.3.1 Thresholds of Significance**

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to GHG emissions if it would:

- 1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or
- 2) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The Appendix G thresholds for GHG's do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact

areas are handled in CEQA. With respect to GHG emissions, the CEQA Guidelines § 15064.4(a) states that lead agencies “shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate” GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project’s GHG emissions or rely on a “qualitative analysis or other performance-based standards.” (14 California Code of Regulations [CCR] 15064.4(b)). A lead agency may use a “model or methodology” to estimate GHG emissions and has the discretion to select the model or methodology it considers “most appropriate to enable decision makers to intelligently take into account the project’s incremental contribution to climate change.” (14 CCR 15064.4(c)). Section 15064.4(b) provides that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment:

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

As previously described, the GHG emission thresholds assist the City in attaining the GHG reduction goals established by AB 32 and SB 32. For the purpose of this evaluation, the proposed General Plan Update is evaluated consistent with BAAQMD guidance for analyzing regional plans. As previously described, the BAAQMD states that regional plans, such as the proposed General Plan Update, would have a less than significant impact related to GHG emissions if can be demonstrated that there is no net increase in GHG emissions. To demonstrate no net increase, two comparative analyses are completed for the projected future emissions:

- A comparison of the existing (base year) emissions with projected future year emissions plus the regional plan’s emissions (base year/regional plan comparison).
- A comparison of the projected future year emissions with projected future year emissions plus the regional plan’s emissions (no regional plan/regional plan comparison).

If both comparative analyses demonstrate no net increase in emissions, the GHG impacts of the General Plan Update would be less than significant. Due to a limitation of data, a comparison of the emissions that would be generated under the proposed General Plan Update cannot be compared to existing conditions, but only to the emissions that would be generated at buildout of the existing General Plan 2001.

### **3.3.2 Methodology**

Impacts related to GHG emissions resulting from implementation (construction and operation) of the proposed General Plan Update are discussed below. The impact analysis is based on calculations of the GHG emissions that would result from projected future growth at buildout of the 2045 General Plan Update.

Compared with buildout of the City of Rio Vista under the existing “General Plan 2001”, buildout of the proposed 2045 General Plan Update would redesignate a total of 773 acres, which would allow for an additional 3,022 residential units, and an additional 113 acres of mixed-use space and 18 acres of retail spaces. Conversely, compared with buildout of the City of Rio Vista under the existing General Plan 2001, buildout of the proposed General Plan Update would reduce the amount of allowable industrial building space by 130 acres. Where criteria air pollutant quantification was required, emissions were modeled using CalEEMod, version 2022.1.28. CalEEMod is a statewide land use emissions computer model designed to quantify potential GHG emissions associated with operations from a variety of land use projects. The net increase in GHG emissions generated by the 2045 General Plan Update are estimated based on CalEEMod default VMT and General Plan land use buildout assumptions. Operational generated GHG emissions calculations employed land uses and acreage provided by the City coupled with the median density/intensity standards contained in the City Municipal Code. (Density/intensity standards indicate how much development is allowed on a single plot of land. A maximum permitted FAR is specified for nonresidential uses. FAR refers to the ratio of building floor space compared to the square footage of the site.) Operational generated GHG emissions calculations employed land uses and acreage provided by the Project proponent as well as median building square footage and dwelling units allowed per information the City’s General Plan Land Use Element.

### **3.3.3 Impact Analysis**

#### **3.3.3.1 *Project Construction-Generated Greenhouse Gas Emissions Resulting in Conflicts with any Applicable Plan, Policy, or Regulation of an Agency Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases***

The General Plan Update would accommodate future development for residential, commercial, recreational, and industrial uses. The future development and other physical changes that could result from the implementation of the General Plan Update would generate construction related GHG emissions from worker commute trips, haul trucks carrying supplies and materials to and from the construction site, and off-road construction equipment (e.g., dozers, loaders, excavators).

Construction activities associated with the proposed General Plan Update would occur over the buildout horizon of the plan, causing short-term GHG emissions. For the proposed General Plan Update, which is a broad policy plan, it is not possible to determine whether the scale and phasing of individual construction projects would exceed recommended GHG construction thresholds due to project-level variability and uncertainties related to future individual projects in terms of detailed site plans, construction schedules, equipment requirements, etc., which are not currently determined or even proposed<sup>2</sup>. Nonetheless, depending on how development proceeds, construction-generated GHG emissions associated with the proposed General Plan Update could potentially exceed the recommended threshold of significance for

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<sup>2</sup> As previously stated, the YSAQMD has no established GHG emissions thresholds. In absence of thresholds of significance, this analysis employs the use of the methods and protocols for preparing a plan-level analysis of the BAAQMD. The BAAQMD does not promulgate a plan-level or project-level construction GHG threshold. Thus, this analysis also cites the project-level construction significance threshold established by the SMAQMD. The SMAQMD has adopted a numeric threshold of 1,100 metric tons of CO<sub>2e</sub> annually from construction activities.

construction activities. Overall, GHG emissions related to construction must be addressed on a project-by-project basis, and information regarding specific development projects, soil types, and the locations of receptors would be needed to quantify the level of impact associated with construction activity.

As previously described, proposed General Plan Update Policy OSC-13 would require application of the analysis methods and significance thresholds recommended by the YSAQMD to determine a future project's GHG-related impacts. The YSAQMD has not adopted thresholds of significance for GHG emissions. In absence of thresholds of significance, this analysis employs the use of the methods and protocols for preparing a plan-level analysis of the BAAQMD. The BAAQMD is the air quality officer for the San Francisco Bay Area Air Basin, which directly borders the City of Rio Vista. The BAAQMD does not promulgate a plan-level or project-level construction GHG threshold. Thus, this analysis cites the project-level construction significance threshold established by the SMAQMD, the air quality officer for the metropolitan Sacramento region. The SMAQMD has adopted a numeric threshold of 1,100 metric tons of CO<sub>2</sub>e annually from construction activities. The significance criteria established by the SMAQMD for future construction projects instigated by the proposed General Plan Update may be relied upon to make a determination of impact significance level.

Future development projects allowed under the proposed General Plan Update that are projected to exceed the significance threshold are required to implement mitigation measures in order to reduce GHG emissions as much as feasible; however, the significance threshold may still be exceeded as a result of construction activities allowed under the proposed General Plan Update. Since it cannot be guaranteed that construction of future projects allowed under the proposed General Plan Update would generate GHG emissions below the significance threshold due to the programmatic and conceptual nature of the proposed General Plan Update and uncertainties related to future individual projects, this is considered a significant impact.

### ***3.3.3.2 Project Operational Greenhouse Gas Emissions Resulting in Conflicts with any Applicable Plan, Policy, or Regulation of an Agency Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases***

Development under the proposed General Plan Update would contribute to global climate change through direct and indirect emissions of GHG from land uses within the City. A General Plan does not directly result in development without additional approvals. However, the General Plan Update would guide and facilitate development throughout the City. Before any development can occur in the City, it must be analyzed for consistency with the General Plan, zoning requirements, and other applicable local and State requirements; comply with the requirements of CEQA; and obtain all necessary clearances and permits. Future development projects would be subject to the City's standard CEQA review process and would be required to assess project-specific emissions in relation to the YSAQMD significance thresholds. Although specific project-level information for potential future development is not available at this time and the estimation of emissions resulting from future development would be speculative, anticipated maximum annual GHG emissions were quantified and presented in Table 3-2 in order to provide an estimate of the potential overall GHG emissions resulting from the proposed General Plan Update based on the calculation methodology provided in Section 3.3.2, Methodology.

The proposed General Plan Update would have a less than significant impact related to GHG emissions if it can be demonstrated that there is no net increase in GHG emissions. To demonstrate no net increase, two comparative analyses are completed for the projected future emissions as follows:

- A comparison of the existing (base year) emissions with projected future year emissions plus the regional plan's emissions (base year/regional plan comparison).
- A comparison of the projected future year emissions with projected future year emissions plus the regional plan's emissions (no regional plan/regional plan comparison).

In the case that both comparative analyses demonstrate no net increase in emissions, the GHG impacts of the General Plan Update would be less than significant.

<b>Table 3-2. Operational-Related Greenhouse Gas Emissions</b>	
<b>Emission Source</b>	<b>CO<sub>2</sub>e Emissions (Metric Tons/Year)</b>
<b><i>Proposed 2045 General Plan Update Buildout Emissions</i></b>	
Mobile	269,456
Area	561
Energy	133,147
Water	10,805
Waste	14,112
Refrigerants	493
<b>Total</b>	<b>428,574</b>
<b><i>Existing General Plan 2001 Buildout Emissions</i></b>	
Mobile	232,660
Area	361
Energy	84,439
Water	7,493
Waste	9,612
Refrigerants	559
<b>Total</b>	<b>335,124</b>
<b><i>Difference in Proposed 2045 General Plan and Existing General Plan</i></b>	
Mobile	<b>+36,796</b>
Area	<b>155</b>
Energy	<b>+48,708</b>
Water	<b>+3,312</b>
Waste	<b>+4,500</b>
Refrigerants	<b>-66</b>
<b>Total</b>	<b>+93,450</b>

Sources: CalEEMod 2022.1.28 Refer to Attachment A and B for Model Data Outputs.

Notes: Emission projections predominately based on CalEEMod model defaults for Solano County, site acreage provided by the City, and median building square footage and dwelling units allowed per information the City's General Plan Land Use Element.

As shown by Table 3-2, the GHG emissions from buildout of the proposed General Plan Update would be greater than the GHG emissions from buildout of the existing General Plan 2001 buildout by approximately 93,450 metric tons of CO<sub>2</sub>e annually. This net increase of GHG emissions associated with the proposed General Plan Update compared with the existing General Plan 2001 is largely due to mobile-source and energy-source emissions. Since a net increase of GHG emissions would occur as a result of the proposed General Plan Update, the plan-level GHG threshold previously identified would be surpassed.

The General Plan Update does propose several policy provisions that would assist to reduce the generation of GHG emissions from mobile sources. For instance, proposed Land Use and Community Character Element Policy LU-1 seeks the development of compact, complete residential neighborhoods by encouraging the location of services and amenities within walking and biking distance of residences. Policy LU-3 would encourage new residential development to incorporate design features that promote walking and connectivity between blocks and adjacent neighborhoods and in a similar context, Policy LU-6 would encourage development in the North Waterfront District to be a mix of uses including residential, commercial, and public park space along the waterfront. Proposed Policy LU-9 would promote pedestrian-oriented retail and mixed-use development in Neighborhood Mixed Use, Downtown, and the Waterfront areas. The promotion of mixed-use development contributes to less dependency on automobiles, a source of GHG emissions. Mobility and Circulation Policies MC-2, MC-4, and MC-14 proposes to promote the development of bikeways, sidewalks, pedestrian pathways, and multi-use paths that connect residential neighborhoods with other neighborhoods, schools, employment centers, commercial centers and public open space, and that separate bicyclists, skateboarders, and pedestrians from vehicular traffic whenever possible. Proposed Policy MC-15 seeks to ensure that bicycle and pedestrian facilities follow logical routes providing connections between transportation nodes and land uses, including bicycle and pedestrian connections to transit stops, buses that can accommodate bicycles, and park-and-ride lots, so that the pedestrian facilities serve the transportation needs of residents, and are not constructed as “sidewalks to nowhere.” Further, Policy MC-16 seeks to ensure that the City’s circulation network will accommodate all anticipated and potential modes of transportation, including small personal electric vehicles ranging in size up to golf carts. Additionally, Parks & Recreation Policy PR-9 proposes to create an integrated trail, bikeway, and open space network within the City that links parks and recreation areas, schools, downtown, the waterfront, and residential neighborhoods. Lastly, proposed Open Space and Resource Conservation Policy OSC-14 seeks to promote energy conservation programs for all utility users and encourage active and passive solar energy design in building and site development; and promote more tree planting and landscaping in the City to reduce the heat island effect and address climate change.

Development projects accommodated by the proposed General Plan Update would be analyzed on a case-by-case basis when detailed information regarding operational activities is known. Future projects would be subject to the proposed General Plan Update policies identified above, as well as YSAQMD and State rules and regulations. Nonetheless, as shown in Table 3-2, a net increase of GHG emissions from buildout of the existing General Plan 2001 would occur as a result of the proposed General Plan Update. Thus, the identified plan-level GHG threshold would be surpassed. There are no additional plan-level measures available that would reduce impacts from long-term operational-related emissions. All feasible operational emissions reduction measures have been incorporated into the General Plan Update through the inclusion of the policies discussed above. There could be additional project-specific mitigation measures applied to specific future development allowed under the General Plan Update to reduce long-term operational-generated GHG emissions to levels below the applicable thresholds of significance. For instance, as previously described AB 1279, the California Climate Crisis Act, requires California to achieve carbon neutrality as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. The 2022 Scoping Plan Update outlines the mechanisms for how this will be achieved. As stated in the 2022 Update, “the plan outlines how carbon neutrality can be achieved by taking bold steps

to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the State’s natural and working lands and using a variety of mechanical approaches.” Specifically, the 2022 Update identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030, identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels, relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture, and identifies key implementation actions to ensure success. However, the nature, feasibility, and effectiveness of such strategies implemented within Rio Vista cannot be determined at this time. As such, the City cannot assume that mitigation would be available and implemented such that all future operational-related emissions of air pollutants would be reduced to less-than-significant levels. As such, this impact is significant.

### **3.3.3.3 Cumulative Greenhouse Gas Emissions Impacts**

General Plan Update-related GHG emissions are not confined to a particular air basin but are dispersed worldwide. Therefore, impacts under Impact 3.3.3.2 are not project-specific impacts to global warming, but the proposed General Plan Update’s contribution to this cumulative impact. As discussed, a net increase of GHG emissions from buildout of the existing General Plan 2001 would occur as a result of the proposed General Plan Update, resulting in an exceedance of the applicable plan-level significance threshold. Therefore, the proposed General Plan Update-related GHG emissions and their contribution to global climate change would be cumulatively considerable, and GHG emissions impacts would be significant.

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## **LIST OF ATTACHMENTS**

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Attachment A – CalEEMod Output File for Air Quality and Greenhouse Gas Emissions – Proposed 2045  
General Plan Update

Attachment B – CalEEMod Output File for Air Quality Greenhouse Gas Emissions – Existing General Plan  
2001

**ATTACHMENT A**

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CalEEMod Output File for Air Quality and Greenhouse Gas Emissions – Proposed 2045 General Plan  
Update

# 2045 Proposed General Plan Detailed Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

Data Field	Value
Project Name	2045 Proposed General Plan
Operational Year	2045
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	5.70
Precipitation (days)	20.6
Location	Rio Vista, CA 94571, USA
County	Solano-Sacramento
City	Rio Vista
Air District	Yolo/Solano AQMD
Air Basin	Sacramento Valley
TAZ	783
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

## 1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Office Park	1,642	1000sqft	29.0	1,642,212	0.00	—	—	—
Office Park	2,492	1000sqft	44.0	2,491,632	0.00	—	—	—

Office Park	4,358	1000sqft	77.0	4,358,056	0.00	—	—	—
General Office Building	1,237	1000sqft	71.0	1,237,104	0.00	—	—	—
High Turnover (Sit Down Restaurant)	762	1000sqft	50.0	762,300	0.00	—	—	—
Manufacturing	1,960	1000sqft	90.0	1,960,200	0.00	—	—	—
Industrial Park	3,385	1000sqft	222	3,384,912	0.00	—	—	—
Industrial Park	915	1000sqft	60.0	914,760	0.00	—	—	—
Single Family Housing	6,275	Dwelling Unit	1,943	12,236,250	73,498,178	—	17,695	—
Single Family Housing	86.0	Dwelling Unit	156	167,700	1,007,306	—	243	—
Apartments Low Rise	700	Dwelling Unit	35.0	742,000	0.00	—	1,974	—
City Park	68.0	Acre	68.0	0.00	0.00	0.00	—	—
General Office Building	15,573	1000sqft	357	15,572,700	550	—	—	—

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

## 2. Emissions Summary

### 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2,316	1,337	9,170	24.1	41.2	142,842	142,883	39.8	14,549	14,589	36,678	3,063,427	3,100,105	3,863	153	3,543	3,245,705

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,995	1,468	6,807	22.4	38.6	142,842	142,880	37.8	14,549	14,587	36,678	2,900,699	2,937,376	3,872	161	2,992	3,085,267
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,935	1,169	6,001	17.7	36.6	101,339	101,376	35.8	10,332	10,368	36,678	2,413,762	2,450,440	3,853	130	3,161	2,588,612
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	353	213	1,095	3.22	6.69	18,494	18,501	6.53	1,886	1,892	6,072	399,626	405,698	638	21.5	523	428,574

## 2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	979	995	7,109	22.0	13.5	142,842	142,855	12.8	14,549	14,562	—	2,245,153	2,245,153	62.3	114	566	2,281,136
Area	1,318	15.5	1,808	0.10	2.68	—	2.68	2.02	—	2.02	0.00	6,852	6,852	0.29	0.06	—	6,877
Energy	18.1	326	253	1.97	25.0	—	25.0	25.0	—	25.0	—	799,104	799,104	101	8.71	—	804,214
Water	—	—	—	—	—	—	—	—	—	—	12,315	12,318	24,633	1,265	30.2	—	65,265
Waste	—	—	—	—	—	—	—	—	—	—	24,363	0.00	24,363	2,435	0.00	—	85,237
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,977	2,977
Total	2,316	1,337	9,170	24.1	41.2	142,842	142,883	39.8	14,549	14,589	36,678	3,063,427	3,100,105	3,863	153	3,543	3,245,705
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	924	1,143	6,554	20.4	13.6	142,842	142,855	12.8	14,549	14,562	—	2,089,277	2,089,277	72.0	122	14.7	2,127,575
Area	1,053	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	18.1	326	253	1.97	25.0	—	25.0	25.0	—	25.0	—	799,104	799,104	101	8.71	—	804,214
Water	—	—	—	—	—	—	—	—	—	—	12,315	12,318	24,633	1,265	30.2	—	65,265
Waste	—	—	—	—	—	—	—	—	—	—	24,363	0.00	24,363	2,435	0.00	—	85,237
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,977	2,977
Total	1,995	1,468	6,807	22.4	38.6	142,842	142,880	37.8	14,549	14,587	36,678	2,900,699	2,937,376	3,872	161	2,992	3,085,267
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	733	836	4,856	15.6	10.3	101,339	101,350	9.76	10,332	10,342	—	1,598,961	1,598,961	52.1	90.9	184	1,627,528
Area	1,184	7.66	892	0.05	1.32	—	1.32	1.00	—	1.00	0.00	3,379	3,379	0.14	0.03	—	3,391
Energy	18.1	326	253	1.97	25.0	—	25.0	25.0	—	25.0	—	799,104	799,104	101	8.71	—	804,214
Water	—	—	—	—	—	—	—	—	—	—	12,315	12,318	24,633	1,265	30.2	—	65,265
Waste	—	—	—	—	—	—	—	—	—	—	24,363	0.00	24,363	2,435	0.00	—	85,237
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,977	2,977
Total	1,935	1,169	6,001	17.7	36.6	101,339	101,376	35.8	10,332	10,368	36,678	2,413,762	2,450,440	3,853	130	3,161	2,588,612
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	134	152	886	2.86	1.88	18,494	18,496	1.78	1,886	1,887	—	264,726	264,726	8.63	15.0	30.4	269,456
Area	216	1.40	163	0.01	0.24	—	0.24	0.18	—	0.18	0.00	559	559	0.02	< 0.005	—	561
Energy	3.30	59.4	46.2	0.36	4.56	—	4.56	4.56	—	4.56	—	132,301	132,301	16.6	1.44	—	133,147
Water	—	—	—	—	—	—	—	—	—	—	2,039	2,039	4,078	209	5.01	—	10,805
Waste	—	—	—	—	—	—	—	—	—	—	4,034	0.00	4,034	403	0.00	—	14,112
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	493	493
Total	353	213	1,095	3.22	6.69	18,494	18,501	6.53	1,886	1,892	6,072	399,626	405,698	638	21.5	523	428,574

## 4. Operations Emissions Details

### 4.1. Mobile Emissions by Land Use

#### 4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	203	153	1,356	3.91	2.07	26,214	26,216	1.95	2,670	2,672	—	398,634	398,634	12.2	18.1	102	404,440
General Office Building	353	266	2,361	6.82	3.60	45,657	45,661	3.40	4,650	4,653	—	694,295	694,295	21.3	31.5	178	704,407
High Turnover (Sit Down Restaurant)	235	177	1,568	4.53	2.39	30,322	30,324	2.26	3,088	3,090	—	461,094	461,094	14.2	21.0	118	467,810
Manufacturing	13.0	115	139	0.87	1.37	3,513	3,515	1.31	359	360	—	91,522	91,522	1.30	10.8	18.5	94,781
Industrial Park	15.0	132	161	1.01	1.58	4,045	4,047	1.51	413	415	—	105,380	105,380	1.49	12.4	21.3	109,132
Single Family Housing	146	140	1,391	4.43	2.29	30,211	30,214	2.17	3,077	3,079	—	451,228	451,228	10.8	18.1	117	457,013
Apartments Low Rise	13.7	13.1	131	0.42	0.22	2,837	2,837	0.20	289	289	—	42,369	42,369	1.01	1.70	11.0	42,912
City Park	0.32	0.24	2.15	0.01	< 0.005	41.5	41.5	< 0.005	4.23	4.23	—	632	632	0.02	0.03	0.16	641
Total	979	995	7,109	22.0	13.5	142,842	142,855	12.8	14,549	14,562	—	2,245,153	2,245,153	62.3	114	566	2,281,136

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	191	178	1,269	3.63	2.07	26,214	26,216	1.96	2,670	2,672	—	369,619	369,619	14.3	19.8	2.64	375,888
General Office Building	333	310	2,211	6.32	3.61	45,657	45,661	3.41	4,650	4,653	—	643,759	643,759	24.9	34.5	4.60	654,677
High Turnover (Sit Down Restaurant)	221	206	1,468	4.19	2.40	30,322	30,324	2.26	3,088	3,090	—	427,532	427,532	16.5	22.9	3.06	434,783
Manufacturing	12.3	125	132	0.85	1.38	3,513	3,515	1.32	359	360	—	88,784	88,784	1.45	10.9	0.48	92,079
Industrial Park	14.2	144	151	0.98	1.59	4,045	4,047	1.52	413	415	—	102,227	102,227	1.67	12.6	0.55	106,020
Single Family Housing	138	164	1,207	4.10	2.29	30,211	30,214	2.17	3,077	3,079	—	417,563	417,563	11.9	19.7	3.05	423,744
Apartments Low Rise	13.0	15.4	113	0.38	0.22	2,837	2,837	0.20	289	289	—	39,208	39,208	1.12	1.85	0.29	39,788
City Park	0.30	0.28	2.01	0.01	< 0.005	41.5	41.5	< 0.005	4.23	4.23	—	586	586	0.02	0.03	< 0.005	595
Total	924	1,143	6,554	20.4	13.6	142,842	142,855	12.8	14,549	14,562	—	2,089,277	2,089,277	72.0	122	14.7	2,127,575
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	26.0	22.6	166	0.50	0.28	3,366	3,367	0.27	343	343	—	46,269	46,269	1.63	2.34	5.43	47,013
General Office Building	45.9	40.0	293	0.89	0.50	5,955	5,956	0.47	607	608	—	81,852	81,852	2.88	4.14	9.61	83,168
High Turnover (Sit Down Restaurant)	31.3	22.8	157	0.40	0.23	2,612	2,612	0.22	266	266	—	36,923	36,923	1.75	2.18	4.21	37,619
Manufacturing	1.57	15.2	16.1	0.11	0.17	420	420	0.17	42.9	43.1	—	10,242	10,242	0.16	1.24	0.92	10,618

Industrial Park	2.29	22.1	23.3	0.16	0.25	610	610	0.24	62.3	62.6	—	14,874	14,874	0.23	1.81	1.33	15,420
Single Family Housing	24.7	27.3	213	0.74	0.41	5,090	5,090	0.39	519	519	—	68,613	68,613	1.83	3.07	8.21	69,582
Apartments Low Rise	2.12	2.35	18.3	0.06	0.04	438	438	0.03	44.6	44.7	—	5,900	5,900	0.16	0.26	0.71	5,984
City Park	0.03	0.03	0.18	< 0.005	< 0.005	3.76	3.76	< 0.005	0.38	0.38	—	51.6	51.6	< 0.005	< 0.005	0.01	52.5
Total	134	152	886	2.86	1.88	18,494	18,496	1.78	1,886	1,887	—	264,726	264,726	8.63	15.0	30.4	269,456

## 4.2. Energy

### 4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	99,326	99,326	16.1	1.95	—	100,308
General Office Building	—	—	—	—	—	—	—	—	—	—	—	196,616	196,616	31.8	3.86	—	198,560
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	17,106	17,106	2.77	0.34	—	17,275
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	11,316	11,316	1.83	0.22	—	11,428
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	50,291	50,291	8.14	0.99	—	50,788

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	30,308	30,308	4.90	0.59	—	30,608
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	1,739	1,739	0.28	0.03	—	1,756
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	406,702	406,702	65.8	7.98	—	410,724
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	99,326	99,326	16.1	1.95	—	100,308
General Office Building	—	—	—	—	—	—	—	—	—	—	—	196,616	196,616	31.8	3.86	—	198,560
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	17,106	17,106	2.77	0.34	—	17,275
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	11,316	11,316	1.83	0.22	—	11,428
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	50,291	50,291	8.14	0.99	—	50,788
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	30,308	30,308	4.90	0.59	—	30,608
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	1,739	1,739	0.28	0.03	—	1,756
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	406,702	406,702	65.8	7.98	—	410,724
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	16,444	16,444	2.66	0.32	—	16,607

General Office Building	—	—	—	—	—	—	—	—	—	—	—	32,552	32,552	5.27	0.64	—	32,874
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	2,832	2,832	0.46	0.06	—	2,860
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	1,874	1,874	0.30	0.04	—	1,892
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	8,326	8,326	1.35	0.16	—	8,409
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	5,018	5,018	0.81	0.10	—	5,067
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	288	288	0.05	0.01	—	291
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	67,334	67,334	10.9	1.32	—	68,000

#### 4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	3.62	65.8	55.3	0.40	5.00	—	5.00	5.00	—	5.00	—	78,568	78,568	6.95	0.15	—	78,786
General Office Building	7.17	130	109	0.78	9.91	—	9.91	9.91	—	9.91	—	155,526	155,526	13.8	0.29	—	155,957
High Turnover (Sit Down Restaurant)	1.37	24.9	21.0	0.15	1.90	—	1.90	1.90	—	1.90	—	29,769	29,769	2.63	0.06	—	29,851

Manufacturing	1.20	21.8	18.3	0.13	1.66	—	1.66	1.66	—	1.66	—	26,045	26,045	2.30	0.05	—	26,117
Industrial Park	1.83	33.3	28.0	0.20	2.53	—	2.53	2.53	—	2.53	—	39,781	39,781	3.52	0.07	—	39,891
Single Family Housing	2.73	46.7	19.9	0.30	3.78	—	3.78	3.78	—	3.78	—	59,303	59,303	5.25	0.11	—	59,468
Apartments Low Rise	0.16	2.69	1.14	0.02	0.22	—	0.22	0.22	—	0.22	—	3,410	3,410	0.30	0.01	—	3,419
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	18.1	326	253	1.97	25.0	—	25.0	25.0	—	25.0	—	392,402	392,402	34.7	0.74	—	393,490
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	3.62	65.8	55.3	0.40	5.00	—	5.00	5.00	—	5.00	—	78,568	78,568	6.95	0.15	—	78,786
General Office Building	7.17	130	109	0.78	9.91	—	9.91	9.91	—	9.91	—	155,526	155,526	13.8	0.29	—	155,957
High Turnover (Sit Down Restaurant)	1.37	24.9	21.0	0.15	1.90	—	1.90	1.90	—	1.90	—	29,769	29,769	2.63	0.06	—	29,851
Manufacturing	1.20	21.8	18.3	0.13	1.66	—	1.66	1.66	—	1.66	—	26,045	26,045	2.30	0.05	—	26,117
Industrial Park	1.83	33.3	28.0	0.20	2.53	—	2.53	2.53	—	2.53	—	39,781	39,781	3.52	0.07	—	39,891
Single Family Housing	2.73	46.7	19.9	0.30	3.78	—	3.78	3.78	—	3.78	—	59,303	59,303	5.25	0.11	—	59,468
Apartments Low Rise	0.16	2.69	1.14	0.02	0.22	—	0.22	0.22	—	0.22	—	3,410	3,410	0.30	0.01	—	3,419
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	18.1	326	253	1.97	25.0	—	25.0	25.0	—	25.0	—	392,402	392,402	34.7	0.74	—	393,490

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	0.66	12.0	10.1	0.07	0.91	—	0.91	0.91	—	0.91	—	13,008	13,008	1.15	0.02	—	13,044
General Office Building	1.31	23.8	20.0	0.14	1.81	—	1.81	1.81	—	1.81	—	25,749	25,749	2.28	0.05	—	25,821
High Turnover (Sit Down Restaurant)	0.25	4.55	3.82	0.03	0.35	—	0.35	0.35	—	0.35	—	4,929	4,929	0.44	0.01	—	4,942
Manufacturing	0.22	3.98	3.35	0.02	0.30	—	0.30	0.30	—	0.30	—	4,312	4,312	0.38	0.01	—	4,324
Industrial Park	0.33	6.08	5.11	0.04	0.46	—	0.46	0.46	—	0.46	—	6,586	6,586	0.58	0.01	—	6,604
Single Family Housing	0.50	8.53	3.63	0.05	0.69	—	0.69	0.69	—	0.69	—	9,818	9,818	0.87	0.02	—	9,846
Apartments Low Rise	0.03	0.49	0.21	< 0.005	0.04	—	0.04	0.04	—	0.04	—	565	565	0.05	< 0.005	—	566
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	3.30	59.4	46.2	0.36	4.56	—	4.56	4.56	—	4.56	—	64,967	64,967	5.75	0.12	—	65,147

### 4.3. Area Emissions by Source

#### 4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00

Consumer Products	973	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	79.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	266	15.5	1,808	0.10	2.68	—	2.68	2.02	—	2.02	—	6,852	6,852	0.29	0.06	—	6,877
Total	1,318	15.5	1,808	0.10	2.68	—	2.68	2.02	—	2.02	0.00	6,852	6,852	0.29	0.06	—	6,877
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	973	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	79.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1,053	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	178	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	14.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	23.9	1.40	163	0.01	0.24	—	0.24	0.18	—	0.18	—	559	559	0.02	< 0.005	—	561
Total	216	1.40	163	0.01	0.24	—	0.24	0.18	—	0.18	0.00	559	559	0.02	< 0.005	—	561

## 4.4. Water Emissions by Land Use

### 4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	2,892	2,642	5,534	297	7.10	—	15,074
General Office Building	—	—	—	—	—	—	—	—	—	—	5,725	5,229	10,954	588	14.1	—	29,838
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	443	405	848	45.5	1.09	—	2,311
Manufacturing	—	—	—	—	—	—	—	—	—	—	869	793	1,662	89.2	2.13	—	4,527
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,905	1,740	3,646	196	4.68	—	9,930
Single Family Housing	—	—	—	—	—	—	—	—	—	—	433	1,465	1,898	44.6	1.08	—	3,336
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	47.6	43.5	91.1	4.89	0.12	—	248
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	12,315	12,318	24,633	1,265	30.2	—	65,265
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	2,892	2,642	5,534	297	7.10	—	15,074

General Office Building	—	—	—	—	—	—	—	—	—	—	5,725	5,229	10,954	588	14.1	—	29,838
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	443	405	848	45.5	1.09	—	2,311
Manufacturing	—	—	—	—	—	—	—	—	—	—	869	793	1,662	89.2	2.13	—	4,527
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,905	1,740	3,646	196	4.68	—	9,930
Single Family Housing	—	—	—	—	—	—	—	—	—	—	433	1,465	1,898	44.6	1.08	—	3,336
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	47.6	43.5	91.1	4.89	0.12	—	248
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	12,315	12,318	24,633	1,265	30.2	—	65,265
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	479	437	916	49.2	1.18	—	2,496
General Office Building	—	—	—	—	—	—	—	—	—	—	948	866	1,814	97.3	2.33	—	4,940
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	73.4	67.0	140	7.54	0.18	—	383
Manufacturing	—	—	—	—	—	—	—	—	—	—	144	131	275	14.8	0.35	—	750
Industrial Park	—	—	—	—	—	—	—	—	—	—	315	288	604	32.4	0.77	—	1,644
Single Family Housing	—	—	—	—	—	—	—	—	—	—	71.7	243	314	7.39	0.18	—	552

Apartment Low Rise	—	—	—	—	—	—	—	—	—	—	7.89	7.20	15.1	0.81	0.02	—	41.1
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	2,039	2,039	4,078	209	5.01	—	10,805

## 4.5. Waste Emissions by Land Use

### 4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	4,256	0.00	4,256	425	0.00	—	14,891
General Office Building	—	—	—	—	—	—	—	—	—	—	8,425	0.00	8,425	842	0.00	—	29,477
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	4,889	0.00	4,889	489	0.00	—	17,105
Manufacturing	—	—	—	—	—	—	—	—	—	—	1,310	0.00	1,310	131	0.00	—	4,583
Industrial Park	—	—	—	—	—	—	—	—	—	—	2,873	0.00	2,873	287	0.00	—	10,053
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2,327	0.00	2,327	233	0.00	—	8,141
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	279	0.00	279	27.9	0.00	—	976
City Park	—	—	—	—	—	—	—	—	—	—	3.15	0.00	3.15	0.32	0.00	—	11.0

Total	—	—	—	—	—	—	—	—	—	—	24,363	0.00	24,363	2,435	0.00	—	85,237
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	4,256	0.00	4,256	425	0.00	—	14,891
General Office Building	—	—	—	—	—	—	—	—	—	—	8,425	0.00	8,425	842	0.00	—	29,477
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	4,889	0.00	4,889	489	0.00	—	17,105
Manufacturing	—	—	—	—	—	—	—	—	—	—	1,310	0.00	1,310	131	0.00	—	4,583
Industrial Park	—	—	—	—	—	—	—	—	—	—	2,873	0.00	2,873	287	0.00	—	10,053
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2,327	0.00	2,327	233	0.00	—	8,141
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	279	0.00	279	27.9	0.00	—	976
City Park	—	—	—	—	—	—	—	—	—	—	3.15	0.00	3.15	0.32	0.00	—	11.0
Total	—	—	—	—	—	—	—	—	—	—	24,363	0.00	24,363	2,435	0.00	—	85,237
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	705	0.00	705	70.4	0.00	—	2,465
General Office Building	—	—	—	—	—	—	—	—	—	—	1,395	0.00	1,395	139	0.00	—	4,880
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	809	0.00	809	80.9	0.00	—	2,832

Manufacturing	—	—	—	—	—	—	—	—	—	—	217	0.00	217	21.7	0.00	—	759
Industrial Park	—	—	—	—	—	—	—	—	—	—	476	0.00	476	47.5	0.00	—	1,664
Single Family Housing	—	—	—	—	—	—	—	—	—	—	385	0.00	385	38.5	0.00	—	1,348
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	46.2	0.00	46.2	4.62	0.00	—	162
City Park	—	—	—	—	—	—	—	—	—	—	0.52	0.00	0.52	0.05	0.00	—	1.83
Total	—	—	—	—	—	—	—	—	—	—	4,034	0.00	4,034	403	0.00	—	14,112

## 4.6. Refrigerant Emissions by Land Use

### 4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20.7	20.7
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40.9	40.9
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,192	1,192
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	510	510
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,119	1,119

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	88.8	88.8
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.31	5.31
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,977	2,977
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20.7	20.7
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40.9	40.9
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,192	1,192
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	510	510
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,119	1,119
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	88.8	88.8
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.31	5.31
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2,977	2,977
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.42	3.42

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.77	6.77
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	197	197
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	84.5	84.5
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	185	185
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14.7	14.7
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.88	0.88
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	493	493

## 4.7. Offroad Emissions By Equipment Type

### 4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### 4.8. Stationary Emissions By Equipment Type

##### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### 4.9. User Defined Emissions By Equipment Type

##### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### 4.10. Soil Carbon Accumulation By Vegetation Type

##### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

##### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 5. Activity Data

### 5.9. Operational Mobile Sources

#### 5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Office Park	18,179	2,693	1,248	4,945,111	111,850	16,570	7,679	30,425,365
Office Park	27,582	4,086	1,894	7,502,927	169,704	25,141	11,651	46,162,623
Office Park	48,244	7,147	3,312	13,123,196	296,825	43,974	20,378	80,741,979
General Office Building	12,049	2,734	866	3,329,162	74,135	16,821	5,328	20,483,052
High Turnover (Sit Down Restaurant)	85,515	93,306	108,734	32,829,876	219,593	574,073	669,001	122,068,549
Manufacturing	7,704	12,584	9,977	3,184,877	47,397	77,427	61,387	19,595,324
Industrial Park	11,407	8,598	4,197	3,641,174	70,184	52,898	25,824	22,402,743
Industrial Park	3,083	2,323	1,134	984,014	18,967	14,296	6,979	6,054,259

Single Family Housing	59,236	59,863	53,651	21,362,654	650,660	657,553	589,316	234,651,812
Single Family Housing	812	820	735	292,779	8,917	9,012	8,077	3,215,945
Apartments Low Rise	5,124	5,698	4,396	1,862,230	56,283	62,588	48,287	20,455,120
City Park	53.0	133	149	28,543	326	820	916	175,614
General Office Building	151,678	34,416	10,901	41,907,581	933,217	211,746	67,069	257,841,235

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	6275
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	86
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0

Pellet Wood Stoves	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Apartments Low Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	700
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

### 5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
26620548.75	8,873,516	48,485,814	16,161,938	—

### 5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

### 5.11. Operational Energy Consumption

## 5.11.1. Unmitigated

## Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Office Park	34,370,408	204	0.0330	0.0040	47,409,052
Office Park	52,148,205	204	0.0330	0.0040	71,930,975
Office Park	91,211,221	204	0.0330	0.0040	125,812,807
General Office Building	25,891,766	204	0.0330	0.0040	35,713,981
High Turnover (Sit Down Restaurant)	30,609,107	204	0.0330	0.0040	92,886,916
Manufacturing	20,248,783	204	0.0330	0.0040	81,267,163
Industrial Park	70,843,962	204	0.0330	0.0040	97,719,093
Industrial Park	19,145,320	204	0.0330	0.0040	26,408,225
Single Family Housing	53,498,826	204	0.0330	0.0040	182,539,909
Single Family Housing	733,211	204	0.0330	0.0040	2,501,742
Apartments Low Rise	3,111,408	204	0.0330	0.0040	10,639,392
City Park	0.00	204	0.0330	0.0040	0.00
General Office Building	325,926,279	204	0.0330	0.0040	449,568,593

## 5.12. Operational Water and Wastewater Consumption

## 5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Office Park	291,876,494	0.00
Office Park	442,847,094	0.00
Office Park	774,573,627	0.00
General Office Building	219,875,131	0.00
High Turnover (Sit Down Restaurant)	231,383,749	0.00
Manufacturing	453,296,250	0.00

Industrial Park	782,760,900	0.00
Industrial Park	211,538,250	0.00
Single Family Housing	222,830,584	1,171,040,430
Single Family Housing	3,053,933	16,049,324
Apartments Low Rise	24,857,595	0.00
City Park	0.00	0.00
General Office Building	2,767,794,337	7,170

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Office Park	1,527	—
Office Park	2,317	—
Office Park	4,053	—
General Office Building	1,151	—
High Turnover (Sit Down Restaurant)	9,071	—
Manufacturing	2,431	—
Industrial Park	4,197	—
Industrial Park	1,134	—
Single Family Housing	4,259	—
Single Family Housing	58.5	—
Apartments Low Rise	518	—
City Park	5.85	—
General Office Building	14,483	—

## 5.14. Operational Refrigeration and Air Conditioning Equipment

## 5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Office Park	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Office Park	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Office Park	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Manufacturing	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

## 5.15. Operational Off-Road Equipment

### 5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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### 5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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## 5.17. User Defined

Equipment Type	Fuel Type
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## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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### 5.18.1. Biomass Cover Type

#### 5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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### 5.18.2. Sequestration

#### 5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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## 6. Climate Risk Detailed Report

### 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	20.4	annual days of extreme heat
Extreme Precipitation	3.15	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	15.8	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about  $\frac{3}{4}$  an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

### 6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

### 6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	1	1	1	2
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

### 6.4. Climate Risk Reduction Measures

## 7. Health and Equity Details

### 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.3

AQ-PM	16.6
AQ-DPM	7.67
Drinking Water	62.6
Lead Risk Housing	17.0
Pesticides	76.2
Toxic Releases	38.6
Traffic	7.65
Effect Indicators	—
CleanUp Sites	61.7
Groundwater	95.7
Haz Waste Facilities/Generators	92.3
Impaired Water Bodies	99.0
Solid Waste	97.9
Sensitive Population	—
Asthma	85.8
Cardio-vascular	84.6
Low Birth Weights	90.7
Socioeconomic Factor Indicators	—
Education	44.9
Housing	37.5
Linguistic	32.0
Poverty	48.9
Unemployment	—

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—

Above Poverty	55.12639548
Employed	6.582830746
Median HI	48.659053
Education	—
Bachelor's or higher	49.15950212
High school enrollment	100
Preschool enrollment	73.18105993
Transportation	—
Auto Access	57.21801617
Active commuting	64.73758501
Social	—
2-parent households	52.4573335
Voting	80.5338124
Neighborhood	—
Alcohol availability	67.04735019
Park access	20.17194919
Retail density	3.27216733
Supermarket access	35.35223919
Tree canopy	68.22789683
Housing	—
Homeownership	71.19209547
Housing habitability	84.66572565
Low-inc homeowner severe housing cost burden	60.91364045
Low-inc renter severe housing cost burden	71.98768125
Uncrowded housing	83.16437829
Health Outcomes	—
Insured adults	34.59514949
Arthritis	0.0

Asthma ER Admissions	29.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	29.9
Cognitively Disabled	28.0
Physically Disabled	7.8
Heart Attack ER Admissions	26.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	77.3
Children	86.0
Elderly	1.3
English Speaking	64.4
Foreign-born	25.0

Outdoor Workers	14.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	72.0
Traffic Density	23.1
Traffic Access	23.0
Other Indices	—
Hardship	57.9
Other Decision Support	—
2016 Voting	93.7

### 7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	78.0
Healthy Places Index Score for Project Location (b)	50.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

### 7.4. Health & Equity Measures

No Health & Equity Measures selected.

### 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

### 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

## 8. User Changes to Default Data

Screen	Justification
Land Use	Lot acreages updated to reflect information provided by the City. Urban reserve not accounted for in the modeling.
Operations: Fleet Mix	Assuming 30% HDT for all industrial land uses.

CalEEMod Output File for Air Quality and Greenhouse Gas Emissions – Existing General Plan 2001

# Existing General Plan Detailed Report

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8. User Changes to Default Data

# 1. Basic Project Information

## 1.1. Basic Project Information

Data Field	Value
Project Name	Existing General Plan
Operational Year	2024
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	5.70
Precipitation (days)	20.6
Location	Rio Vista, CA 94571, USA
County	Solano-Sacramento
City	Rio Vista
Air District	Yolo/Solano AQMD
Air Basin	Sacramento Valley
TAZ	783
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

## 1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Office Park	2,821	1000sqft	50.0	2,821,400	0.00	—	—	—
Office Park	229	1000sqft	15.0	228,690	0.00	—	—	—

General Office Building	749	1000sqft	43.0	748,832	0.00	—	—	—
High Turnover (Sit Down Restaurant)	488	1000sqft	32.0	487,872	0.00	—	—	—
Manufacturing	6,792	1000sqft	312	6,792,160	0.00	—	—	—
Industrial Park	1,722	1000sqft	113	1,722,168	0.00	—	—	—
Industrial Park	1,189	1000sqft	78.0	1,188,768	0.00	—	—	—
General Office Building	960	1000sqft	63.0	960,498	0.00	—	—	—
Single Family Housing	4,266	Dwelling Unit	2,093	8,318,700	49,967,048	—	12,030	—
Single Family Housing	85.0	Dwelling Unit	154	165,750	995,593	—	240	—
City Park	15.0	Acre	15.0	0.00	0.00	0.00	—	—
General Office Building	412	1000sqft	27.0	411,642	0.00	—	—	—
General Office Building	5,581	1000sqft	256	5,580,800	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,834	1,632	8,299	20.3	38.8	85,329	85,368	37.3	8,694	8,731	25,136	2,454,351	2,479,487	2,671	160	10,209	2,604,217

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,588	1,817	6,895	19.1	37.1	85,329	85,366	36.0	8,694	8,730	25,136	2,334,901	2,360,037	2,685	168	3,553	2,480,823
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,485	1,363	5,583	14.7	32.9	60,051	60,084	31.9	6,125	6,157	25,136	1,888,389	1,913,525	2,660	129	5,573	2,024,165
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	271	249	1,019	2.69	6.01	10,959	10,965	5.83	1,118	1,124	4,162	312,644	316,806	440	21.4	923	335,124

### 2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	969	1,392	6,963	18.8	19.4	85,329	85,348	18.4	8,694	8,712	—	1,934,443	1,934,443	73.0	134	6,834	1,983,089
Area	853	10.1	1,156	0.07	1.75	—	1.75	1.32	—	1.32	0.00	4,406	4,406	0.18	0.04	—	4,421
Energy	12.7	230	180	1.39	17.6	—	17.6	17.6	—	17.6	—	506,969	506,969	61.8	5.04	—	510,017
Water	—	—	—	—	—	—	—	—	—	—	8,541	8,533	17,075	877	21.0	—	45,256
Waste	—	—	—	—	—	—	—	—	—	—	16,595	0.00	16,595	1,659	0.00	—	58,059
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,375	3,375
Total	1,834	1,632	8,299	20.3	38.8	85,329	85,368	37.3	8,694	8,731	25,136	2,454,351	2,479,487	2,671	160	10,209	2,604,217
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	894	1,587	6,716	17.7	19.5	85,329	85,349	18.4	8,694	8,712	—	1,819,399	1,819,399	87.6	142	177	1,864,116
Area	681	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	12.7	230	180	1.39	17.6	—	17.6	17.6	—	17.6	—	506,969	506,969	61.8	5.04	—	510,017
Water	—	—	—	—	—	—	—	—	—	—	8,541	8,533	17,075	877	21.0	—	45,256
Waste	—	—	—	—	—	—	—	—	—	—	16,595	0.00	16,595	1,659	0.00	—	58,059
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,375	3,375
Total	1,588	1,817	6,895	19.1	37.1	85,329	85,366	36.0	8,694	8,730	25,136	2,334,901	2,360,037	2,685	168	3,553	2,480,823
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	706	1,128	4,833	13.3	14.5	60,051	60,065	13.7	6,125	6,138	—	1,370,714	1,370,714	62.2	103	2,197	1,405,278
Area	766	4.99	570	0.03	0.86	—	0.86	0.65	—	0.65	0.00	2,173	2,173	0.09	0.02	—	2,180
Energy	12.7	230	180	1.39	17.6	—	17.6	17.6	—	17.6	—	506,969	506,969	61.8	5.04	—	510,017
Water	—	—	—	—	—	—	—	—	—	—	8,541	8,533	17,075	877	21.0	—	45,256
Waste	—	—	—	—	—	—	—	—	—	—	16,595	0.00	16,595	1,659	0.00	—	58,059
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,375	3,375
Total	1,485	1,363	5,583	14.7	32.9	60,051	60,084	31.9	6,125	6,157	25,136	1,888,389	1,913,525	2,660	129	5,573	2,024,165
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	129	206	882	2.43	2.64	10,959	10,962	2.50	1,118	1,120	—	226,937	226,937	10.3	17.1	364	232,660
Area	140	0.91	104	0.01	0.16	—	0.16	0.12	—	0.12	0.00	360	360	0.02	< 0.005	—	361
Energy	2.32	41.9	32.8	0.25	3.21	—	3.21	3.21	—	3.21	—	83,935	83,935	10.2	0.84	—	84,439
Water	—	—	—	—	—	—	—	—	—	—	1,414	1,413	2,827	145	3.47	—	7,493
Waste	—	—	—	—	—	—	—	—	—	—	2,747	0.00	2,747	275	0.00	—	9,612
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	559	559
Total	271	249	1,019	2.69	6.01	10,959	10,965	5.83	1,118	1,124	4,162	312,644	316,806	440	21.4	923	335,124

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	130	108	839	1.86	1.63	9,416	9,418	1.53	959	960	—	189,821	189,821	8.83	9.90	727	193,719
General Office Building	289	240	1,864	4.13	3.62	20,919	20,923	3.41	2,131	2,134	—	421,730	421,730	19.6	22.0	1,615	430,389
High Turnover (Sit Down Restaurant)	268	223	1,729	3.84	3.36	19,407	19,410	3.16	1,976	1,980	—	391,230	391,230	18.2	20.4	1,498	399,263
Manufacturing	82.8	507	735	4.06	6.04	12,174	12,180	5.76	1,243	1,249	—	426,221	426,221	9.68	51.2	1,140	442,867
Industrial Park	18.6	114	165	0.91	1.36	2,739	2,740	1.30	280	281	—	95,886	95,886	2.18	11.5	257	99,631
Single Family Housing	180	201	1,629	4.01	3.42	20,666	20,669	3.23	2,105	2,108	—	409,370	409,370	14.4	19.1	1,596	417,032
City Park	0.13	0.11	0.82	< 0.005	< 0.005	9.16	9.16	< 0.005	0.93	0.93	—	185	185	0.01	0.01	0.71	188
Total	969	1,392	6,963	18.8	19.4	85,329	85,348	18.4	8,694	8,712	—	1,934,443	1,934,443	73.0	134	6,834	1,983,089
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Office Park	120	127	825	1.73	1.63	9,416	9,418	1.54	959	960	—	176,489	176,489	10.8	10.9	18.8	180,017
General Office Building	266	283	1,834	3.84	3.62	20,919	20,923	3.41	2,131	2,134	—	392,110	392,110	24.0	24.1	41.9	399,947
High Turnover (Sit Down Restaurant)	247	262	1,701	3.56	3.36	19,407	19,410	3.16	1,976	1,980	—	363,752	363,752	22.3	22.4	38.8	371,022
Manufacturing	76.0	552	710	3.94	6.06	12,174	12,180	5.78	1,243	1,249	—	413,916	413,916	11.1	52.1	29.6	429,735
Industrial Park	17.1	124	160	0.89	1.36	2,739	2,740	1.30	280	281	—	93,118	93,118	2.50	11.7	6.65	96,676
Single Family Housing	168	238	1,485	3.72	3.43	20,666	20,669	3.23	2,105	2,108	—	379,841	379,841	16.8	20.9	41.4	386,543
City Park	0.12	0.12	0.80	< 0.005	< 0.005	9.16	9.16	< 0.005	0.93	0.93	—	172	172	0.01	0.01	0.02	175
Total	894	1,587	6,716	17.7	19.5	85,329	85,349	18.4	8,694	8,712	—	1,819,399	1,819,399	87.6	142	177	1,864,116
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	16.1	16.1	105	0.24	0.22	1,209	1,209	0.21	123	123	—	22,075	22,075	1.20	1.28	38.7	22,526
General Office Building	36.4	36.4	236	0.54	0.50	2,729	2,729	0.47	278	279	—	49,816	49,816	2.71	2.89	87.4	50,833
High Turnover (Sit Down Restaurant)	34.3	27.2	178	0.34	0.33	1,672	1,672	0.31	170	171	—	31,370	31,370	2.34	2.09	53.5	32,104
Manufacturing	9.63	67.5	85.1	0.50	0.77	1,455	1,455	0.73	149	149	—	47,745	47,745	1.19	5.93	56.5	49,597
Industrial Park	2.73	19.1	24.1	0.14	0.22	413	413	0.21	42.2	42.4	—	13,547	13,547	0.34	1.68	16.0	14,073
Single Family Housing	29.7	39.6	254	0.67	0.61	3,482	3,482	0.58	355	356	—	62,369	62,369	2.51	3.25	112	63,512

City Park	0.01	0.01	0.07	< 0.005	< 0.005	0.83	0.83	< 0.005	0.08	0.08	—	15.1	15.1	< 0.005	< 0.005	0.03	15.4
Total	129	206	882	2.43	2.64	10,959	10,962	2.50	1,118	1,120	—	226,937	226,937	10.3	17.1	364	232,660

## 4.2. Energy

### 4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	35,675	35,675	5.77	0.70	—	36,028
General Office Building	—	—	—	—	—	—	—	—	—	—	—	90,084	90,084	14.6	1.77	—	90,975
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	10,948	10,948	1.77	0.21	—	11,056
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	39,211	39,211	6.34	0.77	—	39,599
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	34,048	34,048	5.51	0.67	—	34,384
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	20,731	20,731	3.35	0.41	—	20,936
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	230,697	230,697	37.3	4.52	—	232,978
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Office Park	—	—	—	—	—	—	—	—	—	—	—	35,675	35,675	5.77	0.70	—	36,028
General Office Building	—	—	—	—	—	—	—	—	—	—	—	90,084	90,084	14.6	1.77	—	90,975
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	10,948	10,948	1.77	0.21	—	11,056
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	39,211	39,211	6.34	0.77	—	39,599
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	34,048	34,048	5.51	0.67	—	34,384
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	20,731	20,731	3.35	0.41	—	20,936
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	230,697	230,697	37.3	4.52	—	232,978
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	5,906	5,906	0.96	0.12	—	5,965
General Office Building	—	—	—	—	—	—	—	—	—	—	—	14,914	14,914	2.41	0.29	—	15,062
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	1,813	1,813	0.29	0.04	—	1,830
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	6,492	6,492	1.05	0.13	—	6,556
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	5,637	5,637	0.91	0.11	—	5,693
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3,432	3,432	0.56	0.07	—	3,466
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	38,195	38,195	6.18	0.75	—	38,572
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4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	1.30	23.7	19.9	0.14	1.80	—	1.80	1.80	—	1.80	—	28,220	28,220	2.50	0.05	—	28,298
General Office Building	3.28	59.7	50.2	0.36	4.54	—	4.54	4.54	—	4.54	—	71,258	71,258	6.31	0.13	—	71,455
High Turnover (Sit Down Restaurant)	0.88	16.0	13.4	0.10	1.21	—	1.21	1.21	—	1.21	—	19,052	19,052	1.69	0.04	—	19,105
Manufacturing	4.16	75.6	63.5	0.45	5.75	—	5.75	5.75	—	5.75	—	90,247	90,247	7.99	0.17	—	90,497
Industrial Park	1.24	22.6	19.0	0.14	1.72	—	1.72	1.72	—	1.72	—	26,932	26,932	2.38	0.05	—	27,007
Single Family Housing	1.87	32.0	13.6	0.20	2.58	—	2.58	2.58	—	2.58	—	40,564	40,564	3.59	0.08	—	40,677
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
<b>Total</b>	<b>12.7</b>	<b>230</b>	<b>180</b>	<b>1.39</b>	<b>17.6</b>	<b>—</b>	<b>17.6</b>	<b>17.6</b>	<b>—</b>	<b>17.6</b>	<b>—</b>	<b>276,272</b>	<b>276,272</b>	<b>24.4</b>	<b>0.52</b>	<b>—</b>	<b>277,039</b>
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	1.30	23.7	19.9	0.14	1.80	—	1.80	1.80	—	1.80	—	28,220	28,220	2.50	0.05	—	28,298
General Office Building	3.28	59.7	50.2	0.36	4.54	—	4.54	4.54	—	4.54	—	71,258	71,258	6.31	0.13	—	71,455

High Turnover (Sit Down Restaurant)	0.88	16.0	13.4	0.10	1.21	—	1.21	1.21	—	1.21	—	19,052	19,052	1.69	0.04	—	19,105
Manufacturing	4.16	75.6	63.5	0.45	5.75	—	5.75	5.75	—	5.75	—	90,247	90,247	7.99	0.17	—	90,497
Industrial Park	1.24	22.6	19.0	0.14	1.72	—	1.72	1.72	—	1.72	—	26,932	26,932	2.38	0.05	—	27,007
Single Family Housing	1.87	32.0	13.6	0.20	2.58	—	2.58	2.58	—	2.58	—	40,564	40,564	3.59	0.08	—	40,677
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	12.7	230	180	1.39	17.6	—	17.6	17.6	—	17.6	—	276,272	276,272	24.4	0.52	—	277,039
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	0.24	4.32	3.63	0.03	0.33	—	0.33	0.33	—	0.33	—	4,672	4,672	0.41	0.01	—	4,685
General Office Building	0.60	10.9	9.16	0.07	0.83	—	0.83	0.83	—	0.83	—	11,797	11,797	1.04	0.02	—	11,830
High Turnover (Sit Down Restaurant)	0.16	2.91	2.45	0.02	0.22	—	0.22	0.22	—	0.22	—	3,154	3,154	0.28	0.01	—	3,163
Manufacturing	0.76	13.8	11.6	0.08	1.05	—	1.05	1.05	—	1.05	—	14,941	14,941	1.32	0.03	—	14,983
Industrial Park	0.23	4.12	3.46	0.02	0.31	—	0.31	0.31	—	0.31	—	4,459	4,459	0.39	0.01	—	4,471
Single Family Housing	0.34	5.83	2.48	0.04	0.47	—	0.47	0.47	—	0.47	—	6,716	6,716	0.59	0.01	—	6,734
City Park	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	2.32	41.9	32.8	0.25	3.21	—	3.21	3.21	—	3.21	—	45,740	45,740	4.05	0.09	—	45,867

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	51.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	172	10.1	1,156	0.07	1.75	—	1.75	1.32	—	1.32	—	4,406	4,406	0.18	0.04	—	4,421
Total	853	10.1	1,156	0.07	1.75	—	1.75	1.32	—	1.32	0.00	4,406	4,406	0.18	0.04	—	4,421
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	630	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	51.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	681	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	9.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	15.5	0.91	104	0.01	0.16	—	0.16	0.12	—	0.12	—	360	360	0.02	< 0.005	—	361
Total	140	0.91	104	0.01	0.16	—	0.16	0.12	—	0.12	0.00	360	360	0.02	< 0.005	—	361

### 4.4. Water Emissions by Land Use

#### 4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	1,039	949	1,988	107	2.55	—	5,414
General Office Building	—	—	—	—	—	—	—	—	—	—	2,623	2,396	5,019	269	6.44	—	13,671
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	284	259	543	29.1	0.70	—	1,479
Manufacturing	—	—	—	—	—	—	—	—	—	—	3,010	2,749	5,759	309	7.39	—	15,687
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,290	1,178	2,468	132	3.17	—	6,723
Single Family Housing	—	—	—	—	—	—	—	—	—	—	296	1,002	1,298	30.5	0.74	—	2,282
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	8,541	8,533	17,075	877	21.0	—	45,256

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	1,039	949	1,988	107	2.55	—	5,414
General Office Building	—	—	—	—	—	—	—	—	—	—	2,623	2,396	5,019	269	6.44	—	13,671
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	284	259	543	29.1	0.70	—	1,479
Manufacturing	—	—	—	—	—	—	—	—	—	—	3,010	2,749	5,759	309	7.39	—	15,687
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,290	1,178	2,468	132	3.17	—	6,723
Single Family Housing	—	—	—	—	—	—	—	—	—	—	296	1,002	1,298	30.5	0.74	—	2,282
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	8,541	8,533	17,075	877	21.0	—	45,256
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	172	157	329	17.7	0.42	—	896
General Office Building	—	—	—	—	—	—	—	—	—	—	434	397	831	44.6	1.07	—	2,263
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	47.0	42.9	89.9	4.82	0.12	—	245
Manufacturing	—	—	—	—	—	—	—	—	—	—	498	455	953	51.2	1.22	—	2,597
Industrial Park	—	—	—	—	—	—	—	—	—	—	214	195	409	21.9	0.52	—	1,113

Single Family Housing	—	—	—	—	—	—	—	—	—	—	49.0	166	215	5.05	0.12	—	378
City Park	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	1,414	1,413	2,827	145	3.47	—	7,493

## 4.5. Waste Emissions by Land Use

### 4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	1,529	0.00	1,529	153	0.00	—	5,349
General Office Building	—	—	—	—	—	—	—	—	—	—	3,860	0.00	3,860	386	0.00	—	13,506
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	3,129	0.00	3,129	313	0.00	—	10,947
Manufacturing	—	—	—	—	—	—	—	—	—	—	4,539	0.00	4,539	454	0.00	—	15,881
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,945	0.00	1,945	194	0.00	—	6,806
Single Family Housing	—	—	—	—	—	—	—	—	—	—	1,592	0.00	1,592	159	0.00	—	5,569
City Park	—	—	—	—	—	—	—	—	—	—	0.70	0.00	0.70	0.07	0.00	—	2.43
Total	—	—	—	—	—	—	—	—	—	—	16,595	0.00	16,595	1,659	0.00	—	58,059

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	1,529	0.00	1,529	153	0.00	—	5,349
General Office Building	—	—	—	—	—	—	—	—	—	—	3,860	0.00	3,860	386	0.00	—	13,506
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	3,129	0.00	3,129	313	0.00	—	10,947
Manufacturing	—	—	—	—	—	—	—	—	—	—	4,539	0.00	4,539	454	0.00	—	15,881
Industrial Park	—	—	—	—	—	—	—	—	—	—	1,945	0.00	1,945	194	0.00	—	6,806
Single Family Housing	—	—	—	—	—	—	—	—	—	—	1,592	0.00	1,592	159	0.00	—	5,569
City Park	—	—	—	—	—	—	—	—	—	—	0.70	0.00	0.70	0.07	0.00	—	2.43
Total	—	—	—	—	—	—	—	—	—	—	16,595	0.00	16,595	1,659	0.00	—	58,059
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	253	0.00	253	25.3	0.00	—	886
General Office Building	—	—	—	—	—	—	—	—	—	—	639	0.00	639	63.9	0.00	—	2,236
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	518	0.00	518	51.8	0.00	—	1,812
Manufacturing	—	—	—	—	—	—	—	—	—	—	751	0.00	751	75.1	0.00	—	2,629
Industrial Park	—	—	—	—	—	—	—	—	—	—	322	0.00	322	32.2	0.00	—	1,127

Single Family Housing	—	—	—	—	—	—	—	—	—	—	264	0.00	264	26.3	0.00	—	922
City Park	—	—	—	—	—	—	—	—	—	—	0.12	0.00	0.12	0.01	0.00	—	0.40
Total	—	—	—	—	—	—	—	—	—	—	2,747	0.00	2,747	275	0.00	—	9,612

### 4.6. Refrigerant Emissions by Land Use

#### 4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.42	7.42
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18.7	18.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	763	763
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,768	1,768
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	758	758
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	60.8	60.8
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,375	3,375

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.42	7.42
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18.7	18.7
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	763	763
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,768	1,768
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	758	758
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	60.8	60.8
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,375	3,375
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.23	1.23
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.10	3.10
High Turnover (Sit Down Restaurant)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	126	126
Manufacturing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	293	293
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	125	125

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10.1	10.1
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	559	559

### 4.7. Offroad Emissions By Equipment Type

#### 4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 4.8. Stationary Emissions By Equipment Type

#### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
----------------	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 4.9. User Defined Emissions By Equipment Type

#### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 4.10. Soil Carbon Accumulation By Vegetation Type

#### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
---------	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 5. Activity Data

### 5.9. Operational Mobile Sources

#### 5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Office Park	31,233	4,627	2,144	8,495,941	192,164	28,469	13,193	52,272,256
Office Park	2,532	375	174	688,643	15,576	2,308	1,069	4,236,954
General Office Building	7,294	1,655	524	2,015,176	44,875	10,182	3,225	12,398,606
High Turnover (Sit Down Restaurant)	54,729	59,716	69,590	21,011,120	140,540	367,407	428,161	78,123,871
Manufacturing	26,693	43,606	34,572	11,035,708	164,233	268,289	212,709	67,898,467
Industrial Park	5,804	4,374	2,135	1,852,548	35,708	26,913	13,139	11,398,018
Industrial Park	4,006	3,019	1,474	1,278,766	24,648	18,578	9,069	7,867,757
General Office Building	9,355	2,123	672	2,584,789	57,559	13,060	4,137	15,903,215
Single Family Housing	40,271	40,698	36,474	14,523,200	442,345	447,031	400,641	159,525,837
Single Family Housing	802	811	727	289,375	8,814	8,907	7,983	3,178,550
City Park	11.7	29.4	32.8	6,296	72.0	181	202	38,738
General Office Building	4,009	910	288	1,107,767	24,668	5,597	1,773	6,815,663
General Office Building	54,357	12,334	3,907	15,018,451	334,438	75,884	24,036	92,402,754

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	4266
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	85
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

### 5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
17181011.25	5,727,004	31,414,245	10,471,415	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Office Park	59,050,030	204	0.0330	0.0040	81,451,054
Office Park	4,786,330	204	0.0330	0.0040	6,602,056
General Office Building	15,672,557	204	0.0330	0.0040	21,618,046
High Turnover (Sit Down Restaurant)	19,589,828	204	0.0330	0.0040	59,447,626
Manufacturing	70,162,725	204	0.0330	0.0040	281,593,497
Industrial Park	36,043,834	204	0.0330	0.0040	49,717,303
Industrial Park	24,880,126	204	0.0330	0.0040	34,318,568
General Office Building	20,102,586	204	0.0330	0.0040	27,728,636
Single Family Housing	36,370,676	204	0.0330	0.0040	124,098,048
Single Family Housing	724,685	204	0.0330	0.0040	2,472,652
City Park	0.00	204	0.0330	0.0040	0.00
General Office Building	8,615,394	204	0.0330	0.0040	11,883,701
General Office Building	116,802,441	204	0.0330	0.0040	161,112,229

## 5.12. Operational Water and Wastewater Consumption

### 5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Office Park	501,457,997	0.00
Office Park	40,645,931	0.00
General Office Building	133,092,718	0.00
High Turnover (Sit Down Restaurant)	148,085,599	0.00
Manufacturing	1,570,687,000	0.00
Industrial Park	398,251,350	0.00
Industrial Park	274,902,600	0.00
General Office Building	170,712,909	0.00
Single Family Housing	151,489,286	796,120,869
Single Family Housing	3,018,422	15,862,701
City Park	0.00	0.00
General Office Building	73,162,675	0.00
General Office Building	991,896,501	0.00

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Office Park	2,624	—
Office Park	213	—
General Office Building	696	—
High Turnover (Sit Down Restaurant)	5,806	—
Manufacturing	8,422	—
Industrial Park	2,135	—

Industrial Park	1,474	—
General Office Building	893	—
Single Family Housing	2,895	—
Single Family Housing	57.8	—
City Park	1.29	—
General Office Building	383	—
General Office Building	5,190	—

### 5.14. Operational Refrigeration and Air Conditioning Equipment

#### 5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Office Park	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Office Park	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
High Turnover (Sit Down Restaurant)	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
High Turnover (Sit Down Restaurant)	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0

High Turnover (Sit Down Restaurant)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Manufacturing	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

### 5.15. Operational Off-Road Equipment

#### 5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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### 5.16. Stationary Sources

#### 5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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#### 5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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### 5.17. User Defined

Equipment Type	Fuel Type
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### 5.18. Vegetation

#### 5.18.1. Land Use Change

##### 5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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## 6. Climate Risk Detailed Report

### 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	20.4	annual days of extreme heat
Extreme Precipitation	3.15	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	15.8	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

### 6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

### 6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	1	1	1	2
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

### 6.4. Climate Risk Reduction Measures

## 7. Health and Equity Details

### 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.3
AQ-PM	16.6
AQ-DPM	7.67
Drinking Water	62.6
Lead Risk Housing	17.0
Pesticides	76.2
Toxic Releases	38.6
Traffic	7.65
Effect Indicators	—
CleanUp Sites	61.7
Groundwater	95.7
Haz Waste Facilities/Generators	92.3
Impaired Water Bodies	99.0
Solid Waste	97.9
Sensitive Population	—
Asthma	85.8
Cardio-vascular	84.6
Low Birth Weights	90.7

Socioeconomic Factor Indicators	—
Education	44.9
Housing	37.5
Linguistic	32.0
Poverty	48.9
Unemployment	—

### 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	55.12639548
Employed	6.582830746
Median HI	48.659053
Education	—
Bachelor's or higher	49.15950212
High school enrollment	100
Preschool enrollment	73.18105993
Transportation	—
Auto Access	57.21801617
Active commuting	64.73758501
Social	—
2-parent households	52.45733335
Voting	80.5338124
Neighborhood	—
Alcohol availability	67.04735019
Park access	20.17194919
Retail density	3.27216733

Supermarket access	35.35223919
Tree canopy	68.22789683
Housing	—
Homeownership	71.19209547
Housing habitability	84.66572565
Low-inc homeowner severe housing cost burden	60.91364045
Low-inc renter severe housing cost burden	71.98768125
Uncrowded housing	83.16437829
Health Outcomes	—
Insured adults	34.59514949
Arthritis	0.0
Asthma ER Admissions	29.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	29.9
Cognitively Disabled	28.0
Physically Disabled	7.8
Heart Attack ER Admissions	26.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0

Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	77.3
Children	86.0
Elderly	1.3
English Speaking	64.4
Foreign-born	25.0
Outdoor Workers	14.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	72.0
Traffic Density	23.1
Traffic Access	23.0
Other Indices	—
Hardship	57.9
Other Decision Support	—
2016 Voting	93.7

### 7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	78.0
Healthy Places Index Score for Project Location (b)	50.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.  
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

### 7.4. Health & Equity Measures

No Health & Equity Measures selected.

### 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

### 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

## 8. User Changes to Default Data

Screen	Justification
Land Use	Lot acreages updated to reflect information provided by the City. Ag/open space, study are and County Land not accounted for in the modeling.
Operations: Fleet Mix	Industrial park accounts for 30% HDT per the SCAQMD.

