



Evans Road and Rider Street Multi-Family Housing Greenhouse Gas Analysis City of Perris

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LIST OF ABBREVIATED TERMS

%	percent
°F	degrees Fahrenheit
AB	Assembly Bill
AB 1881	California Water Conservation in Landscaping Act of 2006
AB 32	Global Warming Solutions Act of 2006
ACC	Advanced Clean Cars
ACE	Affordable Clean Energy rule
AQIA	Wildomar Meadows Air Quality Impact Analysis Report
BSC	California Building Standards Commission
C ₂ F ₆	hexafluoroethane
C ₂ H ₆	ethane
CAA	Clean Air Act
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGAPS	California LBNL GHG Analysis of Policies Spreadsheet
CALGreen	California Green Building Standards Code
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CCR	California Code of Regulations
CDFA	Department of Food and Agriculture
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF ₄	tetrafluoromethane
CFCs	Chlorofluorocarbons
CH ₂ FCF	1,1,1,2-tetrafluoroethane
CH ₃ CF ₂	1,1-difluoroethane
CH ₄	methane
CHF ₃	fluoroform
CNRA	California Natural Resources Agency
CNRA 2009	2009 California Climate Adaptation Strategy
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent

CPUC	California Public Utility Commission
CTC	California Transportation Commission
DOF	Department of Finance
DWR	Department of Water Resources
EMFAC	EMissions FACtor model
EV	electric vehicles
FSOR	Final Statement of Reasons
GCC	Global Climate Change
Gg	gigagram
GHG	greenhouse gas
GHGA	Wildomar Meadows Greenhouse Gas Analysis
GO-Biz	Governor's Office of Business and Economic Development
GWP	global warming potential
HDT	heavy-duty trucks
HFCs	hydrofluorocarbons
IBank	California Infrastructure and Economic Development Bank
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Planning
kWh	kilowatt hours
LBNL	Lawrence Berkeley National Laboratory
lbs	pounds
LCA	life-cycle analysis
LCD	Liquid Crystal Display
LCFS	Low Carbon Fuel Standard
LEV III	Low-Emission Vehicle Program
MD	medium-duty
MDT	medium-duty trucks
MM TCO ₂ e/yr	million metric tons of CO ₂ e per year
Mpg	miles per gallon
MRR	Mandatory Reporting Rule
MT CO ₂	metric tons of CO ₂ e
MT CO ₂ e/yr	MT CO ₂ e per year
MT/yr	metric tons per year
MW	megawatts
MWELO	Model Water Efficient Landscape Ordinance
MWh	MW-hour
MY	model year
N ₂ O	nitrous oxide

NF ₃	Nitrogen Trifluoride
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
PFCs	perfluorocarbons
Ppb	parts per billion
Ppm	parts per million
Ppt	parts per trillion
Project	Wildomar Meadows Project
SB	Senate Bill
SB 1078	Renewable Portfolio Standards
SB 1368	Retail Provider Emissions Performance Standards
SB 32	California Global Warming Solutions Act of 2006
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF ₆	sulfur hexafluoride
SGC	Strategic Growth Council
SLPS	Short-Lived Climate Pollutant Strategy
SP	service populations
U.S. Court	United States Supreme Court
VMT	vehicle miles traveled
WCI	Western Climate Initiative
WRCOG	Western Riverside Council of Governments'
WRI	World Resources Institute
ZE/NZE	zero- and near-zero-emission
ZEV	zero-emission vehicles

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this Evans Road and Rider Street Multi-Family Housing Greenhouse Gas Analysis (GHGA) is summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines) (1). Table ES-1 shows the findings of significance for potential greenhouse gas (GHG) impacts under the California Environmental Quality Act (CEQA).

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
GHG Impact #1: Would the Project generate direct or indirect GHG emission that would result in a significant impact on the environment?	3.8	<i>Less Than Significant</i>	<i>N/A</i>
GHG Impact #2: Would the Project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?	3.8	<i>Less Than Significant</i>	<i>N/A</i>

ES.2 PROJECT REQUIREMENTS

The Project would be required to comply with regulations imposed by the State of California and the South Coast Air Quality Management District (SCAQMD) aimed at the reduction of air pollutant emissions. Those that are directly and indirectly applicable to the Project and that would assist in the reduction of greenhouse gas (GHG) emissions include:

- Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32) (2).
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (Senate Bill (SB) 375) (3).
- Pavley Fuel Efficiency Standards (AB 1493). Establishes fuel efficiency ratings for new vehicles (4).
- California Building Code (Title 24 California Code of Regulations (CCR)). Establishes energy efficiency requirements for new construction (5).
- Appliance Energy Efficiency Standards (Title 20 CCR). Establishes energy efficiency requirements for appliances (6).
- Low Carbon Fuel Standard (LCFS). Requires carbon content of fuel sold in California to be 10% less by 2020 (7).
- California Water Conservation in Landscaping Act of 2006 (AB 1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010 to ensure efficient landscapes in new development and reduced water waste in existing landscapes (8).

- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions (9).
- Renewable Portfolio Standards (SB 1078 – also referred to as RPS). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent (%) by 2010 and 33% by 2020 (10).
- California Global Warming Solutions Act of 2006 (SB 32). Requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15 (11).

Promulgated regulations that will affect the Project’s emissions are accounted for in the Project’s GHG calculations provided in this report. In particular, AB 1493, LCFS, and RPS, and therefore are accounted for in the Project’s emission calculations.

ES.3 PROJECT DESIGN FEATURES

The Project Design Feature (PDF) measures listed below (or equivalent language) shall appear on all construction plans, energy-saving and sustainable design features and operational programs would also be incorporated into all structures developed pursuant to the Project. Notably, the Project would comply with the California Green Building Standards Code (CALGreen; California Code of Regulations (CCR), Title 24, Part 11 and the Energy Code CCR, Title 24, Part 6) as implemented by the City of Perris. The Project also incorporates and expresses the following design features and attributes promoting energy efficiency and sustainability. Because these features/attributes are integral to the Project, they are not considered to be mitigation measures.

- The Project shall provide a total of 30 residential EV Charging stations which will be constructed with a listed raceway to accommodate a dedicated 208/240-volt branch circuit in compliance with CalGreen Code Section 4.106.4.1 to facilitate future installation and use of EV charges by future residents.

1 INTRODUCTION

This report presents the results of the GHGA prepared by Urban Crossroads, Inc., for the proposed Evans Road and Rider Street Multi-Family Housing Project (Project). The purpose of this GHGA is to evaluate Project-related construction and operational emissions and determine the level of GHG impacts as a result of constructing and operating the proposed Project.

1.1 SITE LOCATION

The proposed Evans Road and Rider Street Multi-Family Housing site located on the southwest corner of Evans Road and Rider Street in the, as shown on Exhibit 1-A. Access to the project will be via one main driveway on Rider Street.


1.2 PROJECT DESCRIPTION

The proposed Project would involve the construction and occupancy of approximately 300 apartment units, a swimming pool, a clubhouse, and basketball/tennis courts. A preliminary site plan is provided on Exhibit 1-B.

EXHIBIT 1-B: SITE PLAN



LEGEND:

 Site Boundary



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2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. The majority of scientists believe that the climate shift taking place since the Industrial Revolution is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of GHGs in the earth's atmosphere, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. The majority of scientists believe that this increased rate of climate change is the result of GHGs resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough GHG emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GLOBAL CLIMATE CHANGE DEFINED

GCC refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO₂, N₂O, CH₄, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the earth's atmosphere, but prevent radioactive heat from escaping, thus warming the earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages.

Gases that trap heat in the atmosphere are often referred to as GHGs. GHGs are released into the atmosphere by both natural and anthropogenic activity. Without the natural GHG effect, the earth's average temperature would be approximately 61 degrees Fahrenheit (°F) cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

2.3 GREENHOUSE GASES

GREENHOUSE GASES AND HEALTH EFFECTS

GHGs trap heat in the atmosphere, creating a GHG effect that results in global warming and climate change. Many gases demonstrate these properties and as discussed in Table 2-1. For the purposes of this analysis, emissions of CO₂, CH₄, and N₂O were evaluated (see Table 3-1 later in this report) because these gases are the primary contributors to GCC from development projects.

Although there are other substances such as fluorinated gases that also contribute to GCC, these fluorinated gases were not evaluated as their sources are not well-defined and do not contain accepted emissions factors or methodology to accurately calculate these gases.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
Water	<p>Water is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which water is involved is critically important to projecting future climate change.</p> <p>As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative</p>	<p>The main source of water vapor is evaporation from the oceans (approximately 85%). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.</p>	<p>There are no known direct health effects related to water vapor at this time. It should be noted however that when some pollutants react with water vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through water vapor.</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	<p>humidity can be higher (in essence, the air is able to ‘hold’ more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a “positive feedback loop.” The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the earth’s surface and heat it up) (12).</p>		

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
CO ₂	<p>CO₂ is an odorless and colorless GHG. Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO₂ concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30%. Left unchecked, the concentration of CO₂ in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (13).</p>	<p>CO₂ is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and wood. CO₂ is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (14).</p>	<p>Outdoor levels of CO₂ are not high enough to result in negative health effects.</p> <p>According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of CO₂ can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current concentrations of CO₂ in the earth's atmosphere are estimated to be approximately 370 ppm, the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000 ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (15).</p>
CH ₄	<p>CH₄ is an extremely effective absorber of radiation, although its atmospheric concentration is less than</p>	<p>CH₄ has both natural and anthropogenic sources. It is released as part</p>	<p>CH₄ is extremely reactive with oxidizers, halogens, and other halogen-containing</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	<p>CO₂ and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs.</p>	<p>of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of CH₄. Other anthropocentric sources include fossil-fuel combustion and biomass burning (16).</p>	<p>compounds. Exposure to high levels of CH₄ can cause asphyxiation, loss of consciousness, headache and dizziness, nausea and vomiting, weakness, loss of coordination, and an increased breathing rate.</p>
<p>N₂O</p>	<p>N₂O, also known as laughing gas, is a colorless GHG. Concentrations of N₂O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb).</p>	<p>N₂O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some</p>	<p>N₂O can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage) (17).</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
		<p>industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. N₂O can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction (17).</p>	
<p>Chlorofluorocarbons (CFCs)</p>	<p>CFCs are gases formed synthetically by replacing all hydrogen atoms in CH₄ or ethane (C₂H₆) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically</p>	<p>CFCs have no natural source but were first synthesized in 1928. They were used for refrigerants,</p>	<p>In confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	<p>unreactive in the troposphere (the level of air at the earth's surface).</p>	<p>aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years (18).</p>	<p>high or too low) or asphyxiation.</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
HFCs	<p>HFCs are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential (GWP). The HFCs with the largest measured atmospheric abundances are (in order), fluoroform (CHF₃), 1,1,1,2-tetrafluoroethane (CH₂FCF), and 1,1-difluoroethane (CH₃CF₂). Prior to 1990, the only significant emissions were of CHF₃. CH₂FCF emissions are increasing due to its use as a refrigerant.</p>	<p>HFCs are manmade for applications such as automobile air conditioners and refrigerants.</p>	<p>No health effects are known to result from exposure to HFCs.</p>
PFCs	<p>PFCs have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above earth’s surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF₄) and hexafluoroethane (C₂F₆). The EPA estimates</p>	<p>The two main sources of PFCs are primary aluminum production and semiconductor manufacture.</p>	<p>No health effects are known to result from exposure to PFCs.</p>

TABLE 2-1: GREENHOUSE GASES

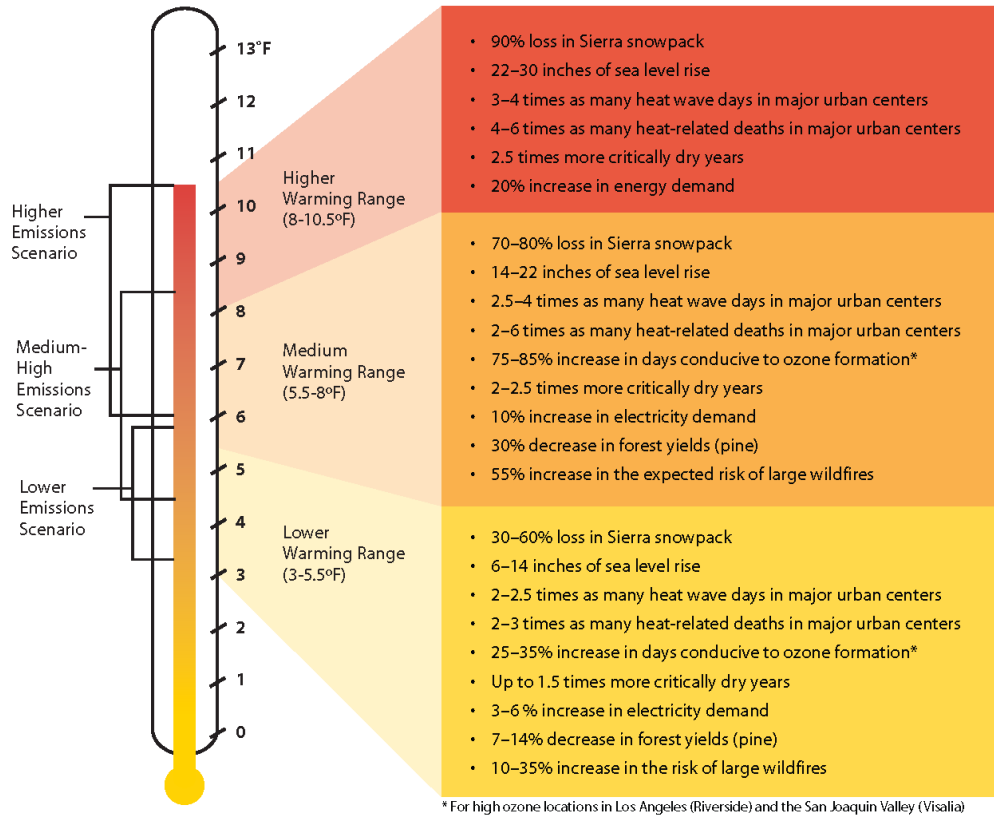
Greenhouse Gases	Description	Sources	Health Effects
	<p>that concentrations of CF₄ in the atmosphere are over 70 parts per trillion (ppt).</p>		
SF ₆	<p>SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900) (19). The EPA indicates that concentrations in the 1990s were about 4 ppt.</p>	<p>SF₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.</p>	<p>In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.</p>

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
Nitrogen Trifluoride (NF ₃)	NF ₃ is a colorless gas with a distinctly moldy odor. The World Resources Institute (WRI) indicates that NF ₃ has a 100-year GWP of 17,200 (20).	NF ₃ is used in industrial processes and is produced in the manufacturing of semiconductors, Liquid Crystal Display (LCD) panels, types of solar panels, and chemical lasers.	Long-term or repeated exposure may affect the liver and kidneys and may cause fluorosis (21).

The potential health effects related directly to the emissions of CO₂, CH₄, and N₂O as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to GCC have the potential to cause adverse effects to human health. Increases in Earth’s ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (22). Exhibit 2-A presents the potential impacts of global warming (23).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT, 2070-2099 (AS COMPARED WITH 1961-1990)



* For high ozone locations in Los Angeles (Riverside) and the San Joaquin Valley (Visalia)

Source: Barbara H. Allen-Diaz. "Climate change affects us all." *University of California, Agriculture and Natural Resources*, 2009.

2.4 GLOBAL WARMING POTENTIAL

GHGs have varying GWP values. GWP of a GHG indicates the amount of warming a gas causes over a given period of time and represents the potential of a gas to trap heat in the atmosphere. CO₂ is utilized as the reference gas for GWP, and thus has a GWP of 1. CO₂ equivalent (CO₂e) is a term used for describing the difference GHGs in a common unit. CO₂e signifies the amount of CO₂ which would have the equivalent GWP.

The atmospheric lifetime and GWP of selected GHGs are summarized at Table 2-2. As shown in the table below, GWP for the Second Assessment Report, the Intergovernmental Panel on Climate Change (IPCC)'s scientific and socio-economic assessment on climate change, range from 1 for CO₂ to 23,900 for SF₆ and GWP for the IPCC's 5th Assessment Report range from 1 for CO₂ to 23,500 for SF₆ (24).

TABLE 2-2: GWP AND ATMOSPHERIC LIFETIME OF SELECT GHGS

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)	
		Second Assessment Report	5 th Assessment Report
CO ₂	See*	1	1
CH ₄	12.4	21	28
N ₂ O	121	310	265
HFC-23	222	11,700	12,400
HFC-134a	13.4	1,300	1,300
HFC-152a	1.5	140	138
SF ₆	3,200	23,900	23,500

*As per Appendix 8.A. of IPCC's 5th Assessment Report, no single lifetime can be given.

Source: Table 2.14 of the IPCC Fourth Assessment Report, 2007

2.5 GREENHOUSE GAS EMISSIONS INVENTORIES

STATE OF CALIFORNIA

California has significantly slowed the rate of growth of GHG emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls but is still a substantial contributor to the U.S. emissions inventory total (25). The California Air Resource Board (CARB) compiles GHG inventories for the State of California. Based upon the 2020 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2018 In 2018, emissions from GHG emitting activities statewide were 425 million metric tons of carbon dioxide equivalent (MMT CO₂e), 0.8 MMT CO₂e higher than 2017 levels and 6 MMT CO₂e below the 2020 GHG Limit of 431 MMT CO₂e. (MMT CO₂e/yr) (26).

2.6 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

PUBLIC HEALTH

Higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35% under the lower warming range to 75 to 85% under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of

death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

WATER RESOURCES

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90%. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

AGRICULTURE

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25% of the water supply needed. Although higher CO₂ levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts.

In addition, continued GCC could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the

emerging gaps. Continued GCC could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

FORESTS AND LANDSCAPES

GCC has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55%, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90% due to decreased precipitation.

Moreover, continued GCC has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80% by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of GCC.

RISING SEA LEVELS

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.7 REGULATORY SETTING

FEDERAL

Prior to the last decade, there have been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are actions regarding the federal government, GHGs, and fuel efficiency.

GHG Endangerment. In *Massachusetts v. Environmental Protection Agency* 549 U.S. 497 (2007), decided on April 2, 2007, the United States Supreme Court (U.S. Court) found that four GHGs, including CO₂, are air pollutants subject to regulation under Section 202(a)(1) of the Clean Air Act (CAA). The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs— CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section “Clean Vehicles” below. After a lengthy legal challenge, the U.S. Court declined to review an Appeals Court ruling that upheld the EPA Administrator’s findings (27).

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

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty (MD) passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO₂ per mile, equivalent to 35.5 miles per gallon (mpg) if the automobile industry were to meet this CO₂ level solely through fuel economy improvements. Together, these standards would cut CO₂ emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the NHTSA issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012. The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and MD passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO₂ in model year 2025, which is equivalent to 54.5 mpg if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks (HDT) and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20% reduction in CO₂ emissions and fuel consumption by the 2018 model year. For HDT and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10% reduction for gasoline vehicles and a 15% reduction for diesel vehicles by the 2018 model year (12 and 17% respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10% reduction in fuel consumption and CO₂ emissions from the 2014 to 2018 model years.

On April 2, 2018, the EPA signed the Mid-term Evaluation Final Determination, which declared that the MY 2022-2025 GHG standards are not appropriate and should be revised (28). This Final Determination serves to initiate a notice to further consider appropriate standards for MY 2022-2025 light-duty vehicles. On August 2, 2018, the NHTSA in conjunction with the EPA, released a

notice of proposed rulemaking, the *Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks* (SAFE Vehicles Rule). The SAFE Vehicles Rule was proposed to amend existing Corporate Average Fuel Economy (CAFE) and tailpipe CO₂ standards for passenger cars and light trucks and to establish new standards covering model years 2021 through 2026. As of March 31, 2020, the NHTSA and EPA finalized the SAFE Vehicle Rule which increased stringency of CAFE and CO₂ emissions standards by 1.5% each year through model year 2026 (29).

As of January 2021, Executive Order 13990 directed the U.S. Environmental Protection Agency (EPA) to reconsider the Agency's 2019 action titled "The Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program Rule (SAFE-1)" for the purposes of rescinding the action taken by the prior administration. Therefore the U.S. EPA is seeking public comment on its reconsideration of the SAFE-1 and will hold a virtual public hearing on this action on June 2, 2021 and the public comment period on the Notice of Reconsideration will be open until July 6 (30).

Mandatory Reporting of GHGs. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of GHGs Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the U.S. and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons per year (MT/yr) or more of GHG emissions are required to submit annual reports to the EPA.

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

"This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the CAA, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for GHG emissions until at least April 30, 2016."

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

Standards of Performance for GHG Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of CO₂ for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts (MW) would be required to meet an output-based standard of 1,000 pounds (lbs) of CO₂ per MW-hour (MWh), based on the performance of widely used natural gas combined cycle technology. It should be noted that on February 9, 2016, the U.S. Court issued a stay of this regulation pending litigation. Additionally, the current EPA Administrator has also signed a measure to repeal the Clean Power Plan, including the CO₂ standards. The Clean Power Plan was officially repealed on June 19, 2019, when the EPA issued the final Affordable Clean Energy rule (ACE). Under ACE, new state emission guidelines were established that provided existing coal-fired electric utility generating units with achievable standards.

Cap-and-Trade. Cap-and-trade refers to a policy tool where emissions are limited to a certain amount and can be traded or provides flexibility on how the emitter can comply. Successful examples in the U.S. include the Acid Rain Program and the N₂O Budget Trading Program and Clean Air Interstate Rule in the northeast. There is no federal GHG cap-and-trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap-and-trade.

The Regional GHG Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps CO₂ emissions from power plants, auctions CO₂ emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008 and in 2020 has retained all participating states.

The Western Climate Initiative (WCI) partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15% below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap-and-trade system January 1, 2014, and joint offset auctions took place in 2015. While the WCI has yet to publish whether it has successfully reached the 2020 emissions goal initiative set in 2007, SB 32, requires that California, a major partner in the WCI, adopt the goal of reducing statewide GHG emissions to 40% below the 1990 level by 2030.

SmartWay Program. The SmartWay Program is a public-private initiative between the EPA, large and small trucking companies, rail carriers, logistics companies, commercial manufacturers, retailers, and other federal and state agencies. Its purpose is to improve fuel efficiency and the environmental performance (reduction of both GHG emissions and air pollution) of the goods movement supply chains. SmartWay is comprised of four components (31):

1. SmartWay Transport Partnership: A partnership in which freight carriers and shippers commit to benchmark operations, track fuel consumption, and improve performance annually.
2. SmartWay Technology Program: A testing, verification, and designation program to help freight companies identify equipment, technologies, and strategies that save fuel and lower emissions.

3. SmartWay Vehicles: A program that ranks light-duty cars and small trucks and identifies superior environmental performers with the SmartWay logo.
4. SmartWay International Interests: Guidance and resources for countries seeking to develop freight sustainability programs modeled after SmartWay.

SmartWay effectively refers to requirements geared towards reducing fuel consumption. Most large trucking fleets driving newer vehicles are compliant with SmartWay design requirements. Moreover, over time, all HDTs will have to comply with the CARB GHG Regulation that is designed with the SmartWay Program in mind, to reduce GHG emissions by making them more fuel-efficient. For instance, in 2015, 53 foot or longer dry vans or refrigerated trailers equipped with a combination of SmartWay-verified low-rolling resistance tires and SmartWay-verified aerodynamic devices would obtain a total of 10% or more fuel savings over traditional trailers.

Through the SmartWay Technology Program, the EPA has evaluated the fuel saving benefits of various devices through grants, cooperative agreements, emissions and fuel economy testing, demonstration projects and technical literature review. As a result, the EPA has determined the following types of technologies provide fuel saving and/or emission reducing benefits when used properly in their designed applications, and has verified certain products:

- Idle reduction technologies – less idling of the engine when it is not needed would reduce fuel consumption.
- Aerodynamic technologies minimize drag and improve airflow over the entire tractor-trailer vehicle. Aerodynamic technologies include gap fairings that reduce turbulence between the tractor and trailer, side skirts that minimize wind under the trailer, and rear fairings that reduce turbulence and pressure drop at the rear of the trailer.
- Low rolling resistance tires can roll longer without slowing down, thereby reducing the amount of fuel used. Rolling resistance (or rolling friction or rolling drag) is the force resisting the motion when a tire rolls on a surface. The wheel will eventually slow down because of this resistance.
- Retrofit technologies include things such as diesel particulate filters, emissions upgrades (to a higher tier), etc., which would reduce emissions.
- Federal excise tax exemptions.

CALIFORNIA

Legislative Actions to Reduce GHGs

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

AB 32. The California State Legislature enacted AB 32, which required that GHGs emitted in California be reduced to 1990 levels by the year 2020 (this goal has been met¹). GHGs as defined under AB 32 include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The CARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

“Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.”

SB 32. SB 32 requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80% below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that CARB not only responds to the Governor, but also the Legislature (11).

2017 Scoping Plan. In November 2017, CARB released the *Final 2017 Scoping Plan Update*, which identifies the State’s post-2020 reduction strategy. The *Final 2017 Scoping Plan Update* reflects the 2030 target of a 40% reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32. Key programs that the proposed Second Update builds upon include the Cap-and-Trade Regulation, the LCFS, and much cleaner cars, trucks and freight movement, utilizing cleaner, renewable energy, and strategies to reduce CH₄ emissions from agricultural and other wastes.

The *Final 2017 Scoping Plan Update* establishes a new emissions limit of 260 MMT CO₂e for the year 2030, which corresponds to a 40% decrease in 1990 levels by 2030 (32).

California’s climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (CH₄, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California’s local districts to

¹ Based upon the 2019 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2017 GHG emissions period, California emitted an average 424.1 MMT CO₂e (26). This is less than the 2020 emissions target of 431 MMT CO₂e.

tighten emission limits on a broad spectrum of industrial sources. Major elements of the *Final 2017 Scoping Plan Update* framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks.
- LCFS, with an increased stringency (18% by 2030).
- Implementing SB 350, which expands the RPS to 50% RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of zero-emission vehicles (ZEV) trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing CH₄ and hydrofluorocarbon emissions by 40% and anthropogenic black carbon emissions by 50% by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20% reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California’s land base as a net carbon sink.

Note, however, that the *Final 2017 Scoping Plan Update* acknowledges that:

“[a]chieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA.”

In addition to the statewide strategies listed above, the *Final 2017 Scoping Plan Update* also identifies local governments as essential partners in achieving the State’s long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 metric tons of CO₂e (MT CO₂e) or less per capita by 2030 and 2 MT CO₂e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State’s long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or a performance-based metric using a CAP or other plan to reduce GHG emissions is appropriate.

According to research conducted by the Lawrence Berkeley National Laboratory (LBNL) and supported by CARB, California, under its existing and proposed GHG reduction policies, could achieve the 2030 goals under SB 32. The research utilized a new, validated model known as the California LBNL GHG Analysis of Policies Spreadsheet (CALGAPS), which simulates GHG and criteria pollutant emissions in California from 2010 to 2050 in accordance to existing and future GHG-reducing policies. The CALGAPS model showed that by 2030, emissions could range from 211 to 428 MT CO₂e per year (MT CO₂e/yr), indicating that “even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40% below the 1990 level [of

SB 32].” CALGAPS analyzed emissions through 2050 even though it did not generally account for policies that might be put in place after 2030. Although the research indicated that the emissions would not meet the State’s 80% reduction goal by 2050, various combinations of policies could allow California’s cumulative emissions to remain very low through 2050 (33) (34).

Cap-and-Trade Program. The Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies for California to reduce GHG emissions. According to CARB, a cap-and-trade program will help put California on the path to meet its goal of achieving a 40% reduction in GHG emissions from 1990 levels by 2030. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap will be able to trade permits to emit GHGs within the overall limit.

CARB adopted a California Cap-and-Trade Program pursuant to its authority under AB 32. The Cap-and-Trade Program is designed to reduce GHG emissions from regulated entities by more than 16% between 2013 and 2020, and by an additional 40% by 2030. The statewide cap for GHG emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and will decline over time, achieving GHG emission reductions throughout the program’s duration.

Covered entities that emit more than 25,000 MT CO₂e/yr must comply with the Cap-and-Trade Program. Triggering of the 25,000 MT CO₂e/yr “inclusion threshold” is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of GHG Emissions (Mandatory Reporting Rule or “MRR”).

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or part (if eligible), and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender “compliance instruments” for each MT CO₂e of GHG they emit. There also are requirements to surrender compliance instruments covering 30% of the prior year’s compliance obligation by November of each year (35).

The Cap-and-Trade Program provides a firm cap, which provides the highest certainty of achieving the 2030 target. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by CARB in the *First Update to the Climate Change Scoping Plan*:

“The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative.” (36)

The Cap-and-Trade Program covered approximately 80% of California’s GHG emissions (32). The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects’ electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program’s first compliance period. The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported.

2022 Scoping Plan. On December 15, 2022, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) (37). The 2022 Scoping Plan builds on the 2017 Scoping Plan as well as the requirements set forth by AB 1279, which directs the state to become carbon neutral no later than 2045. To achieve this statutory objective, the 2022 Scoping Plan lays out how California can reduce GHG emissions by 85% below 1990 levels and achieve carbon neutrality by 2045. The Scoping Plan scenario to do this is to “deploy a broad portfolio of existing and emerging fossil fuel alternatives and clean technologies, and align with statutes, Executive Orders, Board direction, and direction from the governor.” The 2022 Scoping Plan sets one of the most aggressive approaches to reach carbon neutrality in the world. Unlike the 2017 Scoping Plan, CARB no longer includes a numeric per capita threshold and instead advocates for compliance with a local GHG reduction strategy (CAP) consistent with CEQA Guidelines section 15183.5.

The key elements of the 2022 CARB Scoping Plan focus on transportation - the regulations that will impact this sector are adopted and enforced by CARB on vehicle manufacturers and outside the jurisdiction and control of local governments. As stated in the Plan’s executive summary:

“The major element of this unprecedented transformation is the aggressive reduction of fossil fuels wherever they are currently used in California, building on and accelerating carbon reduction programs that have been in place for a decade and a half. That means rapidly moving to zero-emission transportation; electrifying the cars, buses, trains, and trucks that now constitute California’s single largest source of planet-warming pollution.”

“[A]pproval of this plan catalyzes a number of efforts, including the development of new regulations as well as amendments to strengthen regulations and programs already in place, not just at CARB but across state agencies.”

Under the 2022 Scoping Plan, the State will lead efforts to meet the 2045 carbon neutrality goal through implementation of the following objectives:

- Reimagine roadway projects that decrease VMT in a way that meets community needs and reduces the need to drive.
- Double local transit capacity and service frequencies by 2030.
- Complete the High-Speed Rail (HSR) System and other elements of the intercity rail network by 2040.
- Expand and complete planned networks of high-quality active transportation infrastructure.

- Increase availability and affordability of bikes, e-bikes, scooters, and other alternatives to light-duty vehicles, prioritizing needs of underserved communities.
- Shift revenue generation for transportation projects away from the gas tax into more durable sources by 2030.
- Authorize and implement roadway pricing strategies and reallocate revenues to equitably improve transit, bicycling, and other sustainable transportation choices.
- Prioritize addressing key transit bottlenecks and other infrastructure investments to improve transit operational efficiency over investments that increase VMT.
- Develop and implement a statewide transportation demand management (TDM) framework with VMT mitigation requirements for large employers and large developments.
- Prevent uncontrolled growth of autonomous vehicle (AV) VMT, particularly zero-passenger miles.
- Channel new mobility services towards pooled use models, transit complementarity, and lower VMT outcomes.
- Establish an integrated statewide system for trip planning, booking, payment, and user accounts that enables efficient and equitable multimodal systems.
- Provide financial support for low-income and disadvantaged Californians' use of transit and new mobility services.
- Expand universal design features for new mobility services.
- Accelerate infill development in existing transportation-efficient places and deploy strategic resources to create more transportation-efficient locations.
- Encourage alignment in land use, housing, transportation, and conservation planning in adopted regional plans (RTP/SCS and RHNA) and local plans (e.g., general plans, zoning, and local transportation plans).
- Accelerate production of affordable housing in forms and locations that reduce VMT and affirmatively further fair housing policy objectives.
- Reduce or eliminate parking requirements (and/or enact parking maximums, as appropriate) and promote redevelopment of excess parking, especially in infill locations.
- Preserve and protect existing affordable housing stock and protect existing residents and businesses from displacement and climate risk.

Included in the 2022 Scoping Plan is a set of Local Actions (Appendix D to the 2022 Scoping Plan) aimed at providing local jurisdictions with tools to reduce GHGs and assist the state in meeting the ambitious targets set forth in the 2022 Scoping Plan. Appendix D to the 2022 Scoping Plan includes a section on evaluating plan-level and project-level alignment with the State's Climate Goals in CEQA GHG analyses. In this section, CARB identifies several recommendations and strategies that should be considered for new development in order to determine consistency with the 2022 Scoping Plan. Notably, this section is focused on Residential and Mixed-Use Projects, in fact CARB states in Appendix D (page 4): "...focuses primarily on climate action plans (CAPs) and local authority over new residential development. It does not address other land use types (e.g., industrial) or air permitting."

Additionally on Page 21 in Appendix D, CARB states: "The recommendations outlined in this section apply only to residential and mixed-use development project types. California currently

faces both a housing crisis and a climate crisis, which necessitates prioritizing recommendations for residential projects to address the housing crisis in a manner that simultaneously supports the State’s GHG and regional air quality goals. CARB plans to continue to explore new approaches for other land use types in the future.” As such, it would be inappropriate to apply the requirements contained in Appendix D of the 2022 Scoping Plan to any land use types other than residential or mixed-use residential development

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

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts, or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the CARB accepts as achieving the GHG emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

AB 1493. California AB 1493 requires CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA’s denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22% reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30% reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program (LEV III) or the Advanced Clean Cars program (ACC). The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34% from 2016 levels by 2025. The new rules

will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles (EV) and hydrogen fuel cell cars. The package will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

SB 350— Clean Energy and Pollution Reduction Act of 2015. SB 350 requires an increase in the RPS, higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for EV charging stations. Provisions for a 50% reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill’s passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

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

EXECUTIVE ORDERS RELATED TO GHG EMISSIONS

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

Executive Order B-55-18 and SB 100. SB 100 raises California’s RPS requirement to 50% renewable resources target by December 31, 2026, and to achieve a 60% target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours (kWh) of those products sold to their retail end-use customers achieve 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030. Executive Order B-55-18 establishes a carbon neutrality goal for the state of California by 2045; and sets a goal to maintain net negative emissions thereafter. The Executive Order directs the California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), the Department of Food and Agriculture (CDFA), and CARB to include sequestration targets in the Natural and Working Lands Climate Change Implementation Plan consistent with the carbon neutrality goal.

Executive Order S-3-05. Executive Order S-3-05 set the following reduction targets for GHG emissions:

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

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. AB 32 as adopted enacts the 2020 GHG reduction goal identified in this Executive Order. However, the Legislature did not include the 2050 GHG reduction goal.

Executive Order S-01-07 – Low Carbon Fuel Standard. Executive Order S-01-07 mandates that a statewide goal shall be established to reduce the carbon intensity of California’s transportation fuels by at least 10% by 2020. The CARB adopted the LCFS on April 23, 2009.

In 2018, the CARB approved amendments to the regulation, which included strengthening the carbon intensity benchmarks through 2030 in compliance with the SB 32 GHG emissions reduction target for 2030. The amendments included crediting opportunities to promote zero emission vehicle adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector (38).

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

Executive Order B-30-15. Executive Order B-30-15 sets an interim statewide GHG emission reduction target to reduce GHG emissions to 40% below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80% below 1990 levels by 2050 and directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of MMT CO₂e. The Order also requires the state’s climate adaptation plan to be updated every three years, and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Order is not legally enforceable for local governments and the private sector. However, SB 32 as adopted enacts the 2030 GHG reduction goal identified in this Executive Order but not the 2050 GHG reduction goal.

CALIFORNIA REGULATIONS AND BUILDING CODES

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

Title 20 CCR. CCR, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. 23 categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.

Title 24 CCR. California Code of Regulations (CCR) Title 24 Part 6: The California Energy Code was first adopted in 1978 in response to a legislative mandate to reduce California’s energy consumption.

The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2009, and is administered by the California Building Standards Commission.

CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2022 California Green Building Code Standards that will be effective on January 1, 2023.

Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction waste and demolition ordinances and defers to them as the ruling guidance provided they establish a minimum 65% diversion requirement.

The code also provides exemptions for areas not served by construction waste and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas (GHG) emissions. The 2022 version of Title 24 was adopted by the CEC and will be effective on January 1, 2023.

The 2022 Title 24 standards would result in less energy use, thereby reducing air pollutant emissions associated with energy consumption in the SCAB and across the State of California. For example, the 2022 Title 24 standards require solar photovoltaic systems for new homes, encourage the use of heat pumps for space and water heating, and require homes to be electric-ready to ease the adoption of cleaner electric heating, cooking, and EV charging. The CEC anticipates that the 2022 energy code will provide \$1.5 billion in consumer benefits and reduce GHG emissions by 10 million metric tons (39). The Project would be required to comply with the applicable standards in place at the time building permit document submittals are made. These require, among other items (40):

RESIDENTIAL MANDATORY MEASURES

- EV Charging (new one- and two-family dwellings and townhouses with attached private garages). For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device (4.106.4.1).

- Short-term bicycle parking. If the new project or an additional alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with tenant spaces that have ten or more tenant-occupants, provide secure bicycle parking for 5% of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility (5.106.4.1.2).
- Designated parking. In new projects or additions to alterations that add ten or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.405.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- Excavated soil and land clearing debris. 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed (5.408.3).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive (5.410.1).
- Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
 - Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (5.303.3.1).
 - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush (5.303.3.2.1). The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (5.303.3.2.2).
 - Showerheads. Single showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute and 80 psi (5.303.3.3.1). When a shower is served by more than one showerhead, the combine flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi (5.303.3.3.2).
 - Faucets and fountains. Nonresidential lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi (5.303.3.4.1). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi (5.303.3.4.2). Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute (5.303.3.4.3). Metering faucets shall not deliver more than 0.20 gallons per cycle (5.303.3.4.4). Metering faucets for wash fountains shall have a maximum flow rate not more than 0.20 gallons per cycle (5.303.3.4.5).
- Residential lavatory faucets shall have a maximum flow rate of not more than 1.2 gallons per minute at 60 psi (4.303.1.4.1). Lavatory faucets in common or public use areas shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi (4.303.1.4.2). Metering faucets shall not deliver more than 0.25 gallons per cycle

(4.303.1.4.3). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute of 60 psi (4.303.1.4.4).

- Outdoor portable water use in landscaped areas. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent (5.304.1).
- Water meters. Separate submeters or metering devices shall be installed for new buildings or additions in excess of 50,000 sf or for excess consumption where any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day (5.303.1.1 and 5.303.1.2).
- Outdoor water use in rehabilitated landscape projects equal or greater than 2,500 sf. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sf requiring a building or landscape permit (5.304.3).
- Commissioning. For new buildings 10,000 sf and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (5.410.2).

Additionally, under California's 2022 Title 24, Part 6 Building Energy Efficiency Standards, solar photovoltaic systems are required for newly constructed low-rise residential buildings and shall be sized sufficient to offset the electricity use of the proposed building as if it was a mixed-fuel building.

MWELO. The MWELO requirements were updated by AB 1881, the Water Conservation Act. The bill requires local agencies to adopt a local landscape ordinance at least as effective in conserving water as MWELO by January 1, 2010. On April 1, 2015, the Department of Water Resources (DWR) was ordered by the governor to update MWELO through expedited regulation. The California Water Commission approved the revised MWELO on July 15, 2015, and it became effective December 15, 2015. New development projects that include landscape areas of 500 sf or more are subject to the MWELO. The update requires:

- More efficient irrigation systems;
- Incentives for graywater usage;
- Improvements in on-site stormwater capture;
- Limiting the portion of landscapes that can be planted with high water use plants; and
- Reporting requirements for local agencies.

SB 97 and the CEQA Guidelines Update. SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the OPR shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the OPR pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010, for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster

Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On December 28, 2018, the Natural Resources Agency announced the OAL approved the amendments to the CEQA Guidelines for implementing the CEQA. The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

Section 15064.3 was added the CEQA Guidelines and states that in determining the significance of a project's GHG emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes. Additionally, a lead agency may use a model or methodology to estimate GHG emissions resulting from a project. The lead agency has 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. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use (41).

REGIONAL

The project is within the South Coast Air Basin (SCAB), which is under the jurisdiction of the SCAQMD.

SCAQMD

The SCAQMD is the agency responsible for air quality planning and regulation in the SCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, the SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the SCAB. On December 5, 2008 the SCAQMD Governing Board adopted an interim greenhouse gas significance threshold of 10,000 MTCO_{2e} for stationary sources, rules, and plans where the SCAQMD is lead agency (SCAQMD permit threshold). The Working Group continued to consider the adoption of significance thresholds for residential and general development projects. The most recent proposal issued in September 2010 contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Threshold, and uses the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
- Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
 - Option 1
 - All industrial land use projects: 10,000 MT CO₂e/yr
 - Based on non-industrial land use type: residential: 3,500 MT CO₂e/yr; commercial: 1,400 MT CO₂e/yr; or mixed use: 3,000 MT CO₂e/yr
 - Option 2
 - All non-industrial land use types: 3,000 MT CO₂e/yr
- Tier 4 has the following options:
 - Option 1: Reduce BAU emissions by a certain percentage; this percentage is currently undefined.
 - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
 - Option 3: 2020 target for service populations (SP), which includes residents and employees: 4.8 MT CO₂e/SP/year for projects and 6.6 MT CO₂e/SP/year for plans;
 - Option 3, 2035 target: 3.0 MT CO₂e/SP/year for projects and 4.1 MT CO₂e/SP/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD's interim thresholds used the Executive Order S-3-05-year 2050 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap CO₂ concentrations at 450 ppm, thus stabilizing global climate. However, the thresholds identified above have not been adopted by the SCAQMD or distributed for widespread public review and comment and the working group tasked with developing the thresholds has not met since September 2010. The future schedule and likelihood of threshold adoption is uncertain. If the CARB adopts statewide significance thresholds, SCAQMD staff plan to report back to the SCAQMD Governing Board regarding any recommended changes or additions to the SCAQMD's interim threshold.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the project would include stationary sources of emissions subject to SCAQMD permits. Notwithstanding, if the Project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009 includes the following rules:

- Rule 2700 defines terms and post global warming potentials.

- Rule 2701, SoCal Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.
- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

2.8 CITY OF PERRIS CLIMATE ACTION PLAN (CAP)

The City of Perris CAP was adopted by the City Council (Resolution Number 4966) on February 23, 2016 (42). The CAP was developed to address global climate change through the reduction of harmful GHG emissions at the community level, and as part of California’s mandated statewide GHG emissions reduction goals under AB 32. Perris’s CAP, including the GHG inventories and forecasts contained within, is based on WRCOG’s Subregional CAP. The Perris CAP utilized WRCOG’s analysis of existing GHG reduction programs and policies that have already been implemented in the subregion and applicable best practices from other regions to assist in meeting the 2020 subregional reduction target. The CAP reduction measures chosen for the City’s CAP were based on their GHG reduction potential, cost-benefit characteristics, funding availability, and feasibility of implementation in the City of Perris. The CAP used an inventory base year of 2010 and included emissions from the following sectors: residential energy, commercial/industrial energy, transportation, waste, and wastewater. The CAP’s 2020 reduction target is 15% below 2010 levels, and the 2035 reduction target is 47.5% below 2010 levels. The City of Perris is expected to meet these reduction targets through implementation of statewide and local measures. Beyond 2020, Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80% below 1990 levels by 2050.

2.9 DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

For GHG emissions and global warming, there is not, at this time, one established, universally agreed-upon “threshold of significance” by which to measure an impact. While the CARB published some draft thresholds in 2008, they were never adopted, and the CARB recommended that local air districts and lead agencies adopt their own thresholds for GHG impacts.

In the absence of other thresholds of significance adopted by the SCAQMD, the City of Perris has been using the 10,000 MT CO₂e threshold of significance for industrial projects and the draft thresholds for non-industrial projects for the purpose of evaluating impacts with respect to project level GHG emissions. This approach is an accepted screening method used by the City of Perris and numerous local agencies throughout South Coast Air Basin and is based on the SCAQMD staff’s proposed GHG screening threshold for stationary source emissions for non-industrial projects, as described in the SCAQMD’s *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* (“SCAQMD Interim GHG Threshold”). The SCAQMD Interim GHG Threshold identifies a screening threshold to determine whether additional analysis is required (43). As noted by the SCAQMD:

“...the...screening level for stationary sources is based on an emission capture rate of 90% for all new or modified projects...the policy objective of [SCAQMD’s] recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90% of all

new or modified stationary source projects. A GHG significance threshold based on a 90% emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90% emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that [SCAQMD] staff estimates that these GHG emissions would account for slightly less than 1% of future 2050 statewide GHG emissions target (85 [MMT CO₂e/yr]). In addition, these small projects may be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory. Finally, these small sources are already subject to [Best Available Control Technology] (BACT) for criteria pollutants and are more likely to be single-permit facilities, so they are more likely to have few opportunities readily available to reduce GHG emissions from other parts of their facility.”
(44)

Thus, and based on guidance from the SCAQMD, if a residential project would emit GHGs less than 3,500 MT CO₂e per year, the project is not considered a substantial GHG emitter and the GHG impact is less than significant, requiring no additional analysis and no mitigation. On the other hand, if a residential project would emit GHGs in excess of 3,500 MT CO₂e/yr, then the project could be considered a substantial GHG emitter, which would require additional analysis and potentially mitigation.

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3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant GHG impact. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related GHG impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to GHG if it would (45):

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ANALYZE GHG EMISSIONS

In April 2022, the California Air Pollution Control Officers Association (CAPCOA) in conjunction with other California air districts, including SCAQMD, released the latest version of the California Emissions Estimator Model (CalEEMod) Version 2022.1. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NO_x, SO_x, CO, PM₁₀, and PM_{2.5}) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (46). Accordingly, the latest version of CalEEMod has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for construction and operational activity are provided in Appendix 3.1.

3.4 LIFE-CYCLE ANALYSIS NOT REQUIRED

A full life-cycle analysis (LCA) for construction and operational activity is not included in this analysis due to the lack of consensus guidance on LCA methodology at this time (47). Life-cycle analysis (i.e., assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development, infrastructure and on-going operations) depends on emission factors or econometric factors that are not well established for all processes. At this time, an LCA would be extremely speculative and thus has not been prepared.

Additionally, the SCAQMD recommends analyzing direct and indirect project GHG emissions generated within California and not life-cycle emissions because the life-cycle effects from a project could occur outside of California, might not be very well understood or documented, and would be challenging to mitigate (48). Additionally, the science to calculate life cycle emissions

is not yet established or well defined; therefore, the SCAQMD has not recommended, and is not requiring, life-cycle emissions analysis.

3.5 CONSTRUCTION EMISSIONS

Project construction activities would generate CO₂ and CH₄ emissions. The report *Evans Road and Rider Street Multi-Family Housing Air Quality Impact Analysis Report (AQIA)* contains detailed information regarding Project construction activities (49). As discussed in the AQIA, Construction related emissions are expected from the following construction activities:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

3.5.1 CONSTRUCTION DURATION

Construction is expected to commence in September 2023 and last through June 2025. The construction schedule utilized in the analysis, shown in Table 3-1, represents a “worst-case” analysis scenario should construction occur any time after the respective dates since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent². The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per the State *CEQA Guidelines*. The duration of construction activity was based on the 2025 opening year.

TABLE 3-1: CONSTRUCTION DURATION

Construction Activity	Start Date	End Date	Days
Site Preparation	9/1/2023	10/1/2023	21
Grading	10/2/2023	11/30/2023	44
Building Construction	11/16/2023	2/8/2025	322
Paving	2/9/2025	3/9/2025	20
Architectural Coating	3/10/2025	6/10/2025	67

3.5.2 CONSTRUCTION EQUIPMENT

Site specific construction fleet may vary due to specific project needs at the time of construction. The associated construction equipment was generally based on CalEEMod 2022.1 defaults. A detailed summary of construction equipment assumptions by phase is provided at Table 3-2. Please refer to specific detailed modeling inputs/outputs contained in Appendix 3.1 of this GHGA.

² As shown in the CalEEMod User’s Guide Version 2022.1, Section 4.3 “Offroad Equipment” as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

3.5.3 CONSTRUCTION EMISSIONS SUMMARY

For Project construction emissions, GHG emissions are quantified and amortized over the life of the Project. To amortize the emissions over the life of the Project, the SCAQMD recommends calculating the total GHG emissions for the construction activities, dividing it by a 30-year project life then adding that number to the annual operational GHG emissions (50). Therefore, Project construction emissions have been amortized over a 30-year period and added to the annual operational GHG emissions. The amortized construction emissions are presented in Table 3-3.

TABLE 3-2: CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Activity	Equipment ¹	Amount	Hours Per Day
Site Preparation	Rubber Tired Dozers	3	8
	Crawler Tractors	4	8
Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Crawler Tractors	2	8
Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Architectural Coating	Air Compressors	1	8

TABLE 3-3 AMORTIZED ANNUAL CONSTRUCTION EMISSIONS

Year	Emissions (MT/yr)				
	CO ₂	CH ₄	N ₂ O	R	Total CO ₂ e ³
2023	776.00	0.02	0.08	0.56	802.00
2024	773.00	0.03	0.03	0.77	785.00
2025	120.00	< 0.005	< 0.005	0.11	121.00
Total GHG Emissions	1669.00	0.05	0.11	1.44	1708.00
Amortized Construction Emissions	55.63	0.00	0.00	0.05	56.93

3.6 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO₂, CH₄, N₂O and R from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions
- Water Supply, Treatment, and Distribution
- Solid Waste
- Refrigerants

3.6.1 AREA SOURCE EMISSIONS

Landscape maintenance equipment are typically the only area sources that would generate emissions GHG emissions, which are primarily due to fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on standard assumptions included in CalEEMod.

3.6.2 ENERGY SOURCE EMISSIONS

COMBUSTION EMISSIONS ASSOCIATED WITH NATURAL GAS AND ELECTRICITY

GHGs are emitted from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel emits CO₂ and other GHGs directly into the atmosphere; these emissions are considered direct emissions associated with a building; the building energy use emissions do not include street lighting⁴. GHGs are also emitted

³ CalEEMod reports the most common GHGs emitted which include CO₂, CH₄, N₂O and R. These GHGs are then converted into the CO₂e by multiplying the individual GHG by the GWP.

⁴ The CalEEMod emissions inventory model does not include indirect emission related to street lighting. Indirect emissions related to street lighting are expected to be negligible and cannot be accurately quantified at this time as there is insufficient information as to the number and type of street lighting that would occur.

during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions. Unless otherwise noted, CalEEMod default parameters were used.

3.6.3 MOBILE SOURCE EMISSIONS

Project mobile source GHG impacts are dependent on both overall daily vehicle trip generation and the effect of the Project on peak hour traffic volumes and traffic operations in the vicinity of the Project. The Project-related GHG impacts are derived primarily from the 2,022 vehicle trips generated by the Project. Trip characteristics available from the TIA report were utilized in this analysis (51).

Additionally, as discussed in Section E.3, the project includes a Project design feature that will install a minimum of 30 residential EV charging stations. This would result in a slight increase in energy demand and decrease in vehicle emissions associated with fuel consumption. EV charging station calculations are included in Appendix 3.2.

3.6.4 WATER SUPPLY, TREATMENT AND DISTRIBUTION

Indirect GHG emissions result from the production of electricity used to convey, treat and distribute water and wastewater. The amount of electricity required to convey, treat and distribute water depends on the volume of water as well as the sources of the water. CalEEMod default parameters were used to estimate GHG emissions associated with water supply, treatment and distribution for the Project scenario.

3.6.5 SOLID WASTE

Residential land uses will result in the generation and disposal of solid waste. A large percentage of this waste will be diverted from landfills by a variety of means, such as reducing the amount of waste generated, recycling, and/or composting. The remainder of the waste not diverted will be disposed of at a landfill. GHG emissions from landfills are associated with the anaerobic breakdown of material. GHG emissions associated with the disposal of solid waste associated with the proposed Project were calculated by CalEEMod using default parameters.

3.6.6 REFRIGERANTS

Air conditioning (A/C) and refrigeration equipment associated with the building are anticipated to generate GHG emissions. CalEEMod automatically generates a default A/C and refrigeration equipment inventory for each project land use subtype based on industry data from the USEPA (2016b). CalEEMod quantifies refrigerant emissions from leaks during regular operation and routine servicing over the equipment lifetime and then derives average annual emissions from the lifetime estimate. Note that CalEEMod does not quantify emissions from the disposal of refrigeration and A/C equipment at the end of its lifetime. Per 17 CCR 95371, new facilities with air conditioning equipment are prohibited from utilizing refrigerants with a GWP of 150 or greater as of January 1, 2025. As such, it was conservatively assumed that air conditioning systems installed at the residential portion of the Project would utilize refrigerants with a GWP of 150. Otherwise, GHG emissions associated with refrigerants were calculated by CalEEMod using default parameters.

3.7 EMISSIONS SUMMARY

IMPACTS WITHOUT PROJECT DESIGN FEATURES AND MITIGATION

The annual GHG emissions associated with the operation of the proposed Project without mitigation are estimated to be approximately 2,972.30 MT CO₂e/yr as summarized in Table 3-4.

3.8 GREENHOUSE GAS EMISSIONS FINDINGS AND RECOMMENDATIONS

3.8.1 GHG IMPACT 1

The Project could generate direct or indirect GHG emissions that would result in a significant impact on the environment.

As shown on Table 3-4, the Project will result in a net total of approximately 2,972.30 MT CO₂/yr; the proposed Project would not exceed the SCAQMD/City’s screening threshold of 3,500 MT CO₂e/yr for residential projects. Thus, the Project would not have the potential to result in a cumulatively considerable impact with respect to GHG emissions. As such, a less than significant impact is expected.

TABLE 3-4: PROJECT GHG EMISSIONS

Emission Source	Emissions (MT/yr)				
	CO ₂	CH ₄	N ₂ O	R	Total CO ₂ e
Amortized Construction Emissions	55.63	1.67E-03	3.67E-03	4.80E-02	56.93
Mobile Source	2,304.00	0.11	0.11	3.95	2,345.00
EV Charger - Fuel Reduction	--	--	--	--	-250.44
Area Source	69.60	< 0.005	< 0.005	0.00	69.70
Energy Source	616.00	0.06	< 0.005	0.00	618.00
EV Charger - Energy Demand	--	--	--	--	33.67
Water Usage	17.00	0.40	0.01	0.00	29.80
Waste	19.80	1.98	0.00	0.00	69.30
Refrigerants	0.00	0.00	0.00	0.34	0.34
Total CO₂e (All Sources)	2,972.30				

Source: CalEEMod output, See Appendix 3.1 for detailed model outputs.

3.8.2 GHG IMPACT 2

The Project could not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

As previously stated, pursuant to 15604.4 of the State *CEQA Guidelines*, a lead agency may rely on qualitative analysis or performance-based standards to determine the significance of impacts from GHG emissions (45). As such, the Project’s consistency with the 2022 Scoping Plan, is

discussed below. It should be noted that the Project's consistency with the 2022 Scoping Plan also satisfies consistency with AB 32 since the 2022 Scoping Plan is based on the overall targets established by AB 32 and SB 32. Consistency with the 2008 and 2017 Scoping Plan is not necessary, since both of these plans have been superseded by the 2022 Scoping Plan. Project consistency with SB 32 and City's General Plan Measures, Energy Efficiency, and CAS is evaluated in the following discussion.

2022 SCOPING PLAN CONSISTENCY

The Project would not impede the State's progress towards carbon neutrality by 2045 under the 2022 Scoping Plan. The Project would be required to comply with applicable current and future regulatory requirements promulgated through the 2022 Scoping Plan. The Project includes design features related to water and solid conservation that will further reduce Project GHG emissions. As such, the Project would not be inconsistent with the 2022 Scoping Plan. Lastly, the Project would be required to comply with applicable elements outlined in the City's CAP which fulfills the description of mitigation found in the State CEQA Guidelines. As such, the Project would be consistent with the 2022 Scoping Plan.

CONSISTENCY WITH THE CITY OF PERRIS CAP

The City of Perris adopted its CAP in February 2016. The measures identified in the CAP represent the City's actions to achieve the GHG reduction targets of AB 32 for target year 2020. Local measures incorporated in the CAP include:

- An energy measure that directs the City to create an energy action plan to reduce energy consumption citywide.
- Land use and transportation measures that encourage alternative modes of transportation (walking, biking, and transit), reduce motor vehicle use by allowing a reduction in parking supply, voluntary transportation demand management to reduce vehicle miles traveled, and land use strategies that improve jobs-housing balance (increased density and mixed-use).
- Solid waste measures that reduce landfilled solid waste in the City.

The Project is located along a Riverside Transit Agency's Bus Route 9 and the Project developer, or a designated representative, would install 30 residential EV Charging stations, which will accommodate a dedicated 208/240-volt branch circuit in compliance with CalGreen Code Section 4.106.4.1 to facilitate future installation and use of EV charges by future residents. The Project will provide waste, recycling, and green waste containers for each home per City of Perris waste regulations. Based on these factors the Project would not conflict with local strategies and state/regional strategies listed in the Perris CAP.

Further, the Project is subject to California Building Code requirements. New buildings must achieve the 2022 Building and Energy Efficiency Standards and the 2022 California Green Building Standards requirements, which include energy conservation measures and solid waste reduction measures. While the Project does not include reduced parking, increased density, or a mixed-use development, it would provide sidewalks and pedestrian walkways to encourage the use of alternative modes of transportation (walking, biking, and transit). As such, the Project would not

conflict with applicable GHG reduction measures in the CAP and a less than significant impact is expected to occur.

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5 CERTIFICATIONS

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Evans Road and Rider Street Multi-Family Housing. The information contained in this air quality impact assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at hqureshi@urbanxroads.com

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Master of Science in Environmental Studies
California State University, Fullerton • May 2010

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AEP – Association of Environmental Planners
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PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April 2008
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**APPENDIX 3.1:
CALEEMOD EMISSIONS MODEL OUTPUTS**

14505-Perris Residential Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	14505-Perris Residential
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	0.20
Location	33.82957842018864, -117.20687262255692
County	Riverside-South Coast
City	Perris
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5500
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas

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
Apartments Low Rise	300	Dwelling Unit	11.2	318,000	0.00	—	969	—
Parking Lot	641	Space	3.44	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction 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.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.93	30.7	47.1	39.6	0.05	2.53	5.89	8.42	2.33	2.74	5.07	—	6,735	6,735	0.26	0.28	15.1	6,839
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.93	30.7	85.5	70.3	0.25	3.02	12.2	15.3	2.81	3.51	6.33	—	37,759	37,759	0.99	4.19	1.77	39,034
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.96	5.87	12.6	20.7	0.03	0.49	2.22	2.61	0.46	0.56	1.01	—	4,686	4,686	0.19	0.50	4.68	4,842
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.36	1.07	2.29	3.78	0.01	0.09	0.40	0.48	0.08	0.10	0.19	—	776	776	0.03	0.08	0.77	802

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2023	5.93	4.99	47.1	39.6	0.05	2.53	5.89	8.42	2.33	2.74	5.07	—	5,787	5,787	0.23	0.05	1.10	5,810
2024	2.81	2.43	14.3	32.6	0.03	0.55	3.10	3.65	0.51	0.74	1.25	—	6,735	6,735	0.26	0.28	15.1	6,839
2025	0.44	30.7	1.37	4.86	< 0.005	0.04	0.56	0.60	0.03	0.13	0.17	—	787	787	0.03	0.02	2.24	797
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	8.93	7.13	85.5	70.3	0.25	3.02	12.2	15.3	2.81	3.51	6.33	—	37,759	37,759	0.99	4.19	1.77	39,034
2024	2.74	2.36	14.6	28.2	0.03	0.55	3.10	3.65	0.51	0.74	1.25	—	6,484	6,484	0.26	0.28	0.39	6,574
2025	2.52	30.7	13.5	27.1	0.03	0.48	3.10	3.58	0.44	0.74	1.18	—	6,411	6,411	0.26	0.28	0.36	6,500
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	1.33	1.07	12.6	9.90	0.03	0.49	1.72	2.21	0.46	0.56	1.01	—	4,686	4,686	0.12	0.50	3.37	4,842
2024	1.96	1.69	10.4	20.7	0.02	0.40	2.22	2.61	0.36	0.53	0.89	—	4,670	4,670	0.19	0.20	4.68	4,739
2025	0.32	5.87	1.71	3.49	< 0.005	0.06	0.35	0.41	0.06	0.08	0.14	—	722	722	0.03	0.03	0.66	732
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.24	0.20	2.29	1.81	0.01	0.09	0.31	0.40	0.08	0.10	0.19	—	776	776	0.02	0.08	0.56	802
2024	0.36	0.31	1.91	3.78	< 0.005	0.07	0.40	0.48	0.07	0.10	0.16	—	773	773	0.03	0.03	0.77	785
2025	0.06	1.07	0.31	0.64	< 0.005	0.01	0.06	0.08	0.01	0.02	0.03	—	120	120	< 0.005	< 0.005	0.11	121

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.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.5	17.8	13.4	87.2	0.20	0.59	5.36	5.95	0.59	0.95	1.54	143	25,976	26,119	15.5	0.84	64.0	26,820
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.29	15.6	13.8	59.8	0.19	0.59	5.36	5.94	0.58	0.95	1.53	143	24,933	25,076	15.5	0.86	3.64	25,725

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.92	15.5	8.99	65.3	0.15	0.24	4.78	5.02	0.24	0.85	1.09	143	18,137	18,280	15.4	0.78	25.9	18,921
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.63	2.83	1.64	11.9	0.03	0.04	0.87	0.92	0.04	0.15	0.20	23.7	3,003	3,027	2.54	0.13	4.29	3,133

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	9.21	8.51	7.48	67.7	0.16	0.12	5.36	5.48	0.11	0.95	1.07	—	16,447	16,447	0.69	0.74	61.9	16,747
Area	2.14	9.17	4.65	18.9	0.03	0.37	—	0.37	0.37	—	0.37	0.00	5,731	5,731	0.11	0.01	—	5,737
Energy	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	3,719	3,719	0.34	0.03	—	3,736
Water	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Waste	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Total	11.5	17.8	13.4	87.2	0.20	0.59	5.36	5.95	0.59	0.95	1.54	143	25,976	26,119	15.5	0.84	64.0	26,820
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.61	7.91	8.02	57.3	0.15	0.12	5.36	5.48	0.11	0.95	1.07	—	15,450	15,450	0.72	0.77	1.61	15,698
Area	0.52	7.64	4.48	1.91	0.03	0.36	—	0.36	0.36	—	0.36	0.00	5,685	5,685	0.11	0.01	—	5,691
Energy	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	3,719	3,719	0.34	0.03	—	3,736
Water	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Waste	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04

Total	9.29	15.6	13.8	59.8	0.19	0.59	5.36	5.94	0.58	0.95	1.53	143	24,933	25,076	15.5	0.86	3.64	25,725
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.63	7.00	7.29	53.0	0.14	0.11	4.78	4.89	0.10	0.85	0.95	—	13,919	13,919	0.64	0.69	23.9	14,164
Area	1.14	8.44	0.42	11.8	< 0.005	0.03	—	0.03	0.03	—	0.03	0.00	421	421	0.01	< 0.005	—	421
Energy	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	3,719	3,719	0.34	0.03	—	3,736
Water	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Waste	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Total	8.92	15.5	8.99	65.3	0.15	0.24	4.78	5.02	0.24	0.85	1.09	143	18,137	18,280	15.4	0.78	25.9	18,921
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.39	1.28	1.33	9.68	0.02	0.02	0.87	0.89	0.02	0.15	0.17	—	2,304	2,304	0.11	0.11	3.95	2,345
Area	0.21	1.54	0.08	2.15	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	69.6	69.6	< 0.005	< 0.005	—	69.7
Energy	0.03	0.01	0.23	0.10	< 0.005	0.02	—	0.02	0.02	—	0.02	—	616	616	0.06	< 0.005	—	618
Water	—	—	—	—	—	—	—	—	—	—	—	3.87	13.1	17.0	0.40	0.01	—	29.8
Waste	—	—	—	—	—	—	—	—	—	—	—	19.8	0.00	19.8	1.98	0.00	—	69.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34	0.34
Total	1.63	2.83	1.64	11.9	0.03	0.04	0.87	0.92	0.04	0.15	0.20	23.7	3,003	3,027	2.54	0.13	4.29	3,133

3. Construction Emissions Details

3.1. Site Preparation (2023) - Unmitigated

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

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

Off-Road Equipment	5.83	4.90	47.0	38.0	0.05	2.53	—	2.53	2.33	—	2.33	—	5,530	5,530	0.22	0.04	—	5,549
Dust From Material Movement:	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.83	4.90	47.0	38.0	0.05	2.53	—	2.53	2.33	—	2.33	—	5,530	5,530	0.22	0.04	—	5,549
Dust From Material Movement:	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.34	0.28	2.71	2.19	< 0.005	0.15	—	0.15	0.13	—	0.13	—	318	318	0.01	< 0.005	—	319
Dust From Material Movement:	—	—	—	—	—	—	0.33	0.33	—	0.15	0.15	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.49	0.40	< 0.005	0.03	—	0.03	0.02	—	0.02	—	52.7	52.7	< 0.005	< 0.005	—	52.9
Dust From Material Movement:	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.09	1.59	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	257	257	0.01	0.01	1.10	261	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	0.10	0.09	0.11	1.20	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	236	236	0.01	0.01	0.03	239	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	0.01	0.01	0.01	0.07	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	13.8	13.8	< 0.005	< 0.005	0.03	14.0	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	2.28	2.28	< 0.005	< 0.005	< 0.005	2.31	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	

3.3. Grading (2023) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.00	4.20	40.9	32.7	0.06	1.96	—	1.96	1.80	—	1.80	—	6,715	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	—	—	2.71	2.71	—	0.99	0.99	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.60	0.51	4.93	3.94	0.01	0.24	—	0.24	0.22	—	0.22	—	810	810	0.03	0.01	—	812
Dust From Material Movement	—	—	—	—	—	—	0.33	0.33	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.90	0.72	< 0.005	0.04	—	0.04	0.04	—	0.04	—	134	134	0.01	< 0.005	—	134
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.12	1.37	0.00	0.00	0.02	0.02	0.00	0.00	0.00	—	270	270	0.01	0.01	0.03	273
Vendor	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	0.00	0.00	0.00
Hauling	0.95	0.35	29.1	6.76	0.16	0.45	1.65	2.10	0.45	0.60	1.05	—	24,220	24,220	0.44	3.85	1.31	25,379
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.17	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	33.0	33.0	< 0.005	< 0.005	0.07	33.4
Vendor	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	0.00	0.00	0.00
Hauling	0.12	0.04	3.52	0.81	0.02	0.05	0.20	0.25	0.05	0.07	0.13	—	2,919	2,919	0.05	0.46	2.64	3,061
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	5.46	5.46	< 0.005	< 0.005	0.01	5.53
Vendor	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	0.00	0.00	0.00
Hauling	0.02	0.01	0.64	0.15	< 0.005	0.01	0.04	0.05	0.01	0.01	0.02	—	483	483	0.01	0.08	0.44	507

3.5. Building Construction (2023) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.62	1.36	12.8	14.3	0.03	0.60	—	0.60	0.55	—	0.55	—	2,630	2,630	0.11	0.02	—	2,639

Onsite truck	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	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	1.15	1.29	< 0.005	0.05	—	0.05	0.05	—	0.05	—	237	237	0.01	< 0.005	—	238	
Onsite truck	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	0.00	0.00	0.00	
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Off-Road Equipment	0.03	0.02	0.21	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	39.2	39.2	< 0.005	< 0.005	—	39.3	
Onsite truck	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	0.00	0.00	0.00	
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	1.20	1.09	1.33	14.8	0.00	0.00	0.18	0.18	0.00	0.00	0.00	—	2,916	2,916	0.14	0.11	0.35	2,951	
Vendor	0.05	0.03	1.23	0.38	0.01	0.01	0.06	0.07	0.01	0.02	0.04	—	1,008	1,008	0.02	0.15	0.07	1,053	
Hauling	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	0.00	0.00	0.00	
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	0.11	0.10	0.12	1.40	0.00	0.00	0.02	0.02	0.00	0.00	0.00	—	266	266	0.01	0.01	0.53	270	
Vendor	< 0.005	< 0.005	0.11	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	90.7	90.7	< 0.005	0.01	0.11	94.9	
Hauling	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	0.00	0.00	0.00	
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	0.02	0.02	0.02	0.26	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	44.0	44.0	< 0.005	< 0.005	0.09	44.6	
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.0	15.0	< 0.005	< 0.005	0.02	15.7	
Hauling	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	0.00	0.00	0.00	

3.7. Building Construction (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.55	1.30	12.2	14.2	0.03	0.54	—	0.54	0.49	—	0.49	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	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	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.55	1.30	12.2	14.2	0.03	0.54	—	0.54	0.49	—	0.49	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.11	0.93	8.72	10.2	0.02	0.39	—	0.39	0.35	—	0.35	—	1,884	1,884	0.08	0.02	—	1,890
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	0.17	1.59	1.86	< 0.005	0.07	—	0.07	0.06	—	0.06	—	312	312	0.01	< 0.005	—	313
Onsite truck	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	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.21	1.11	1.04	18.0	0.00	0.00	0.18	0.18	0.00	0.00	0.00	—	3,109	3,109	0.13	0.11	12.3	3,156
Vendor	0.04	0.03	1.13	0.35	0.01	0.01	0.06	0.07	0.01	0.02	0.04	—	996	996	0.02	0.15	2.81	1,043
Hauling	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	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.15	1.04	1.23	13.6	0.00	0.00	0.18	0.18	0.00	0.00	0.00	—	2,857	2,857	0.14	0.11	0.32	2,893
Vendor	0.04	0.03	1.18	0.36	0.01	0.01	0.06	0.07	0.01	0.02	0.04	—	996	996	0.02	0.15	0.07	1,042
Hauling	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.82	0.74	0.88	10.3	0.00	0.00	0.13	0.13	0.00	0.00	0.00	—	2,073	2,073	0.10	0.08	3.82	2,102
Vendor	0.03	0.02	0.85	0.25	0.01	0.01	0.04	0.05	0.01	0.02	0.03	—	713	713	0.02	0.11	0.86	746
Hauling	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	0.16	1.88	0.00	0.00	0.02	0.02	0.00	0.00	0.00	—	343	343	0.02	0.01	0.63	348
Vendor	0.01	< 0.005	0.15	0.05	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	118	118	< 0.005	0.02	0.14	124
Hauling	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	0.00	0.00	0.00

3.9. Building Construction (2025) - Unmitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.45	1.21	11.3	14.1	0.03	0.47	—	0.47	0.43	—	0.43	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.86	1.08	< 0.005	0.04	—	0.04	0.03	—	0.03	—	201	201	0.01	< 0.005	—	201
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.16	0.20	< 0.005	0.01	—	0.01	0.01	—	0.01	—	33.2	33.2	< 0.005	< 0.005	—	33.4
Onsite truck	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	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.02	0.91	1.04	12.6	0.00	0.00	0.18	0.18	0.00	0.00	0.00	—	2,799	2,799	0.13	0.11	0.29	2,834
Vendor	0.04	0.02	1.13	0.34	0.01	0.01	0.06	0.07	0.01	0.02	0.04	—	982	982	0.02	0.15	0.07	1,027
Hauling	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.09	1.02	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	216	216	0.01	0.01	0.37	219
Vendor	< 0.005	< 0.005	0.09	0.03	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	74.9	74.9	< 0.005	0.01	0.09	78.4
Hauling	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	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.19	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	35.8	35.8	< 0.005	< 0.005	0.06	36.3
Vendor	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.4	12.4	< 0.005	< 0.005	0.02	13.0
Hauling	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	0.00	0.00	0.00

3.11. Paving (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.41	0.55	< 0.005	0.02	—	0.02	0.02	—	0.02	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.07	0.88	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	194	194	0.01	0.01	0.02	197	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	10.8	10.8	< 0.005	< 0.005	0.02	10.9	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	1.79	1.79	< 0.005	< 0.005	< 0.005	1.81	
Vendor	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	0.00	0.00	0.00	
Hauling	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	0.00	0.00	0.00	

3.13. Architectural Coating (2025) - Unmitigated

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

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

Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	30.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	30.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.22	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	32.7	32.7	< 0.005	< 0.005	—	32.8
Architectural Coatings	—	5.57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.41	5.41	< 0.005	< 0.005	—	5.43
Architectural Coatings	—	1.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.19	0.19	3.34	0.00	0.00	0.04	0.04	0.00	0.00	0.00	—	609	609	0.03	0.02	2.24	618
Vendor	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	0.00	0.00	0.00
Hauling	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	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.21	2.52	0.00	0.00	0.04	0.04	0.00	0.00	0.00	—	560	560	0.03	0.02	0.06	567
Vendor	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	0.00	0.00	0.00
Hauling	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	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.49	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	104	104	< 0.005	< 0.005	0.18	106
Vendor	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	0.00	0.00	0.00
Hauling	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	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	< 0.005	< 0.005	0.00	0.00	0.00	—	17.2	17.2	< 0.005	< 0.005	0.03	17.5
Vendor	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	0.00	0.00	0.00
Hauling	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	0.00	0.00	0.00

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	9.21	8.51	7.48	67.7	0.16	0.12	0.89	1.01	0.11	0.27	0.39	—	16,447	16,447	0.69	0.74	61.9	16,747
Parking Lot	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	0.00	0.00	0.00
Total	9.21	8.51	7.48	67.7	0.16	0.12	0.89	1.01	0.11	0.27	0.39	—	16,447	16,447	0.69	0.74	61.9	16,747
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	8.61	7.91	8.02	57.3	0.15	0.12	0.89	1.01	0.11	0.27	0.39	—	15,450	15,450	0.72	0.77	1.61	15,698
Parking Lot	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	0.00	0.00	0.00
Total	8.61	7.91	8.02	57.3	0.15	0.12	0.89	1.01	0.11	0.27	0.39	—	15,450	15,450	0.72	0.77	1.61	15,698
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	1.39	1.28	1.33	9.68	0.02	0.02	0.14	0.16	0.02	0.04	0.06	—	2,304	2,304	0.11	0.11	3.95	2,345
Parking Lot	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	0.00	0.00	0.00
Total	1.39	1.28	1.33	9.68	0.02	0.02	0.14	0.16	0.02	0.04	0.06	—	2,304	2,304	0.11	0.11	3.95	2,345

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	1,962	1,962	0.19	0.02	—	1,973
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	125	125	0.01	< 0.005	—	126
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,087	2,087	0.20	0.02	—	2,099
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	1,962	1,962	0.19	0.02	—	1,973
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	125	125	0.01	< 0.005	—	126
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,087	2,087	0.20	0.02	—	2,099
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	325	325	0.03	< 0.005	—	327
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	20.8	20.8	< 0.005	< 0.005	—	20.9
Total	—	—	—	—	—	—	—	—	—	—	—	—	346	346	0.03	< 0.005	—	348

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

Apartme Low Rise	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	1,632	1,632	0.14	< 0.005	—	1,636
Parking Lot	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
Total	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	1,632	1,632	0.14	< 0.005	—	1,636
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartme nts Low Rise	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	1,632	1,632	0.14	< 0.005	—	1,636
Parking Lot	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
Total	0.15	0.08	1.29	0.55	0.01	0.10	—	0.10	0.10	—	0.10	—	1,632	1,632	0.14	< 0.005	—	1,636
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartme nts Low Rise	0.03	0.01	0.23	0.10	< 0.005	0.02	—	0.02	0.02	—	0.02	—	270	270	0.02	< 0.005	—	271
Parking Lot	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
Total	0.03	0.01	0.23	0.10	< 0.005	0.02	—	0.02	0.02	—	0.02	—	270	270	0.02	< 0.005	—	271

4.3. Area Emissions by Source

4.3.2. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.52	0.26	4.48	1.91	0.03	0.36	—	0.36	0.36	—	0.36	0.00	5,685	5,685	0.11	0.01	—	5,691

Consumer	—	6.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.61	1.53	0.17	17.0	< 0.005	0.01	—	0.01	0.01	—	0.01	—	45.5	45.5	< 0.005	< 0.005	—	45.7
Total	2.14	9.17	4.65	18.9	0.03	0.37	—	0.37	0.37	—	0.37	0.00	5,731	5,731	0.11	0.01	—	5,737
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.52	0.26	4.48	1.91	0.03	0.36	—	0.36	0.36	—	0.36	0.00	5,685	5,685	0.11	0.01	—	5,691
Consumer Products	—	6.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.52	7.64	4.48	1.91	0.03	0.36	—	0.36	0.36	—	0.36	0.00	5,685	5,685	0.11	0.01	—	5,691
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	64.5	64.5	< 0.005	< 0.005	—	64.5
Consumer Products	—	1.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.20	0.19	0.02	2.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.16	5.16	< 0.005	< 0.005	—	5.18
Total	0.21	1.54	0.08	2.15	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	69.6	69.6	< 0.005	< 0.005	—	69.7

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	23.4	79.3	103	2.41	0.06	—	180
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	3.87	13.1	17.0	0.40	0.01	—	29.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.87	13.1	17.0	0.40	0.01	—	29.8

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	120	0.00	120	11.9	0.00	—	418
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	19.8	0.00	19.8	1.98	0.00	—	69.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	19.8	0.00	19.8	1.98	0.00	—	69.3

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.04	2.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34	0.34
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34	0.34

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	TOG	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	TOG	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	TOG	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	TOG	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	TOG	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	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	9/1/2023	10/1/2023	5.00	21.0	—
Grading	Grading	10/2/2023	11/30/2023	5.00	44.0	—
Building Construction	Building Construction	11/16/2023	2/8/2025	5.00	322	—
Paving	Paving	2/9/2025	3/9/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	3/10/2025	6/10/2025	5.00	67.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	341	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	216	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	32.1	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	43.2	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT

Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	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)
Architectural Coating	643,950	214,650	0.00	0.00	8,991

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	73.5	0.00	—
Grading	120,000	—	176	0.00	—
Paving	0.00	0.00	0.00	0.00	3.44

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
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Apartments Low Rise	—	0%
Parking Lot	3.44	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	349	0.03	< 0.005
2024	0.00	349	0.03	< 0.005
2025	0.00	349	0.03	< 0.005

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
Apartments Low Rise	2,022	1,365	1,158	658,721	19,274	13,011	11,038	6,278,926
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Low Rise	—
Wood Fireplaces	0
Gas Fireplaces	270
Propane Fireplaces	0

Electric Fireplaces	0
No Fireplaces	30

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)
643950	214,650	0.00	0.00	8,991

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

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)
Apartments Low Rise	2,054,037	349	0.0330	0.0040	5,091,067
Parking Lot	131,265	349	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Low Rise	12,202,133	0.00
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Low Rise	68.7	0.00
Parking Lot	0.00	0.00

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
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	User Defined	750	< 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

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
—	—

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	29.1	annual days of extreme heat
Extreme Precipitation	1.95	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	6.36	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 (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth 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 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

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	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A
Air Quality	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	4	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A
Air Quality	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	97.6

AQ-PM	53.3
AQ-DPM	47.8
Drinking Water	10.2
Lead Risk Housing	22.0
Pesticides	58.8
Toxic Releases	37.7
Traffic	81.9
Effect Indicators	—
CleanUp Sites	69.4
Groundwater	0.00
Haz Waste Facilities/Generators	53.5
Impaired Water Bodies	0.00
Solid Waste	40.1
Sensitive Population	—
Asthma	65.6
Cardio-vascular	90.6
Low Birth Weights	62.9
Socioeconomic Factor Indicators	—
Education	74.7
Housing	57.9
Linguistic	53.4
Poverty	64.5
Unemployment	15.8

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
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Economic	—
Above Poverty	36.04516874
Employed	38.00846914
Median HI	53.00911074
Education	—
Bachelor's or higher	28.6154241
High school enrollment	100
Preschool enrollment	5.440780187
Transportation	—
Auto Access	94.58488387
Active commuting	6.723983062
Social	—
2-parent households	87.71974849
Voting	9.636853587
Neighborhood	—
Alcohol availability	84.04978827
Park access	11.88245862
Retail density	29.21852945
Supermarket access	12.06210702
Tree canopy	0.590273322
Housing	—
Homeownership	79.23777749
Housing habitability	40.67753112
Low-inc homeowner severe housing cost burden	12.19042731
Low-inc renter severe housing cost burden	27.61452586
Uncrowded housing	47.8121391
Health Outcomes	—

Insured adults	26.49813936
Arthritis	79.8
Asthma ER Admissions	42.9
High Blood Pressure	64.8
Cancer (excluding skin)	87.6
Asthma	27.9
Coronary Heart Disease	81.5
Chronic Obstructive Pulmonary Disease	59.8
Diagnosed Diabetes	52.6
Life Expectancy at Birth	37.8
Cognitively Disabled	88.7
Physically Disabled	83.0
Heart Attack ER Admissions	7.5
Mental Health Not Good	28.5
Chronic Kidney Disease	64.9
Obesity	17.5
Pedestrian Injuries	92.5
Physical Health Not Good	37.9
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	30.9
Current Smoker	25.4
No Leisure Time for Physical Activity	29.5
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	35.2

Elderly	90.4
English Speaking	42.3
Foreign-born	59.5
Outdoor Workers	11.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	72.4
Traffic Density	65.3
Traffic Access	23.0
Other Indices	—
Hardship	70.6
Other Decision Support	—
2016 Voting	23.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	69.0
Healthy Places Index Score for Project Location (b)	30.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
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	Taken from Site Plan Lot acreage is the ratio between CalEEMod default acreage and Project site acreage.
Construction: Construction Phases	Client provided schedule
Construction: Off-Road Equipment	T/L/B replaced with Crawler Tractor to accurately calculate disturbance for Site Preparation and Grading phases Standard 8-hour work days
Construction: Architectural Coatings	SCAQMD Rule 1113
Operations: Vehicle Data	Trips rates taken from Traffic Analysis and ITE weekend rates
Characteristics: Project Details	e
Operations: Hearths	Rule 445 no wood burning devices, Wood burning devices added to gas devices
Operations: Refrigerants	Beginning 1 January 2025, all new air conditioning equipment may not use refrigerants with a GWP of 750 or greater

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**APPENDIX 3.2:
EV CHARGING STATIONS CALCULATIONS**

GHG Emissions Reduction from Electric Vehicle Charging Stations

Parameters	Unit	
Estimating GHG Emissions Reductions from Replacement of Gasoline Vehicles with Electric Vehicles		
SCE Electricity Emission Factor ¹	0.16	MT CO ₂ e/MWH
Fuel Economy of Electric Vehicle ²	0.25	kWh/mi
Gasoline/Diesel CO ₂ e Emission while Running ³	296	g/mi
Annual Energy Delivery per Parking Spot ⁴	7,056	kWh/charging station/yr
Annual VMT Reduction per Parking Spot ⁵	28,224	mi/charging station/yr
Number of Parking Spots Provided Chargers ⁶	30	charging stations
Annual VMT Reduction from All Stations (Based on Charge)	846,720	mi/yr
Estimated Benefit from Installing On-Site Electric Vehicle Charging Stations		
GHG Emissions of Gasoline/Diesel Vehicle ⁷	250.44	MTCO ₂ e/yr
GHG Emissions of Electric Vehicle ⁸	33.67	
Annual GHG Emissions Reductions	217	MTCO₂e/yr

¹ CO₂e weighted intensity factor for SCE accounts for CO₂ and CH₄ emissions rates under the 33% RPS for 2020.

² US Department of Energy, 2013. Benefits and Considerations of Electricity as a Vehicle Fuel. Available at: https://afdc.energy.gov/fuels/electricity_benefits.html

³ Running exhaust emission rates for CO₂, CH₄, and N₂O were estimated using EMFAC2021 for light-duty gasoline and diesel-powered vehicles, aggregated for all models and speeds, averaged over all seasons in calendar year 2025. Emission rate was converted to CO₂e using the 4th Assessment Report Global Warming Potentials. Available at: <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory>

⁴ Annual Energy Delivery and VMT reduction based on an average monthly energy delivery of 588 kWh per charging station for conventional Level 2 chargers, as estimated by the California Energy Commission. Available at: <https://ww2.energy.ca.gov/2018publications/CEC-500-2018-020/CEC-500-2018-020.pdf>

⁵ Annual VMT reduction calculated as the annual energy delivery divided by the fuel economy of an electric vehicle.

⁶ Number of charging stations based on project commitment.

⁷ GHG emissions calculated using annual VMT reduction at all stations and CO₂e emission rate.

⁸ GHG emissions calculated using annual VMT reduction at all stations, fuel economy of electric vehicles, along with SCE electricity CO₂e emission factor.

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