Stratford Ranch East
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_2F_6	hexafluoroethane
C_2H_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_2FCF	1,1,1,2-tetrafluoroethane
CH_3CF_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_2e	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_2e/yr	million metric tons of CO_2e per year
Mpg	miles per gallon
MRR	Mandatory Reporting Rule
MT CO_2	metric tons of CO_2e
MT CO_2e/yr	MT CO_2e per year
MT/yr	metric tons per year
MW	megawatts
MWELO	Model Water Efficient Landscape Ordinance
MWh	MW-hour
MY	model year
N_2O	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
SF6	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 Stratford Ranch East Greenhouse Gas Analysis (GHGA) is summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for potential greenhouse gas (GHG) impacts under 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	*Less Than Significant*	*N/A*
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	*Less Than Significant*	*N/A*

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 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 5 residential EV Charging stations in the garages of 5 separate dwelling units.

1 INTRODUCTION

This report presents the results of the GHGA prepared by Urban Crossroads, Inc., for the proposed Stratford Ranch East 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 Project site is located on the northeast corner of Evans Road and Ramona Expressway, as shown on Exhibit 1-A. The Perris Reservoir and the Perris Auto Speedway Racetrack are located to northeast of the Project site 0.70 miles and 0.15 miles, respectively. Residential homes are located to the north, south and southwest of the Project site. The Project land use is consistent with the City of Perris General Plan land use designation and zoning.

1.2 PROJECT DESCRIPTION

The Project is proposed to consist of 197 single family detached residential dwelling units. The Project site plan is shown in Exhibit 1-B.

EXHIBIT 1-A: LOCATION MAP

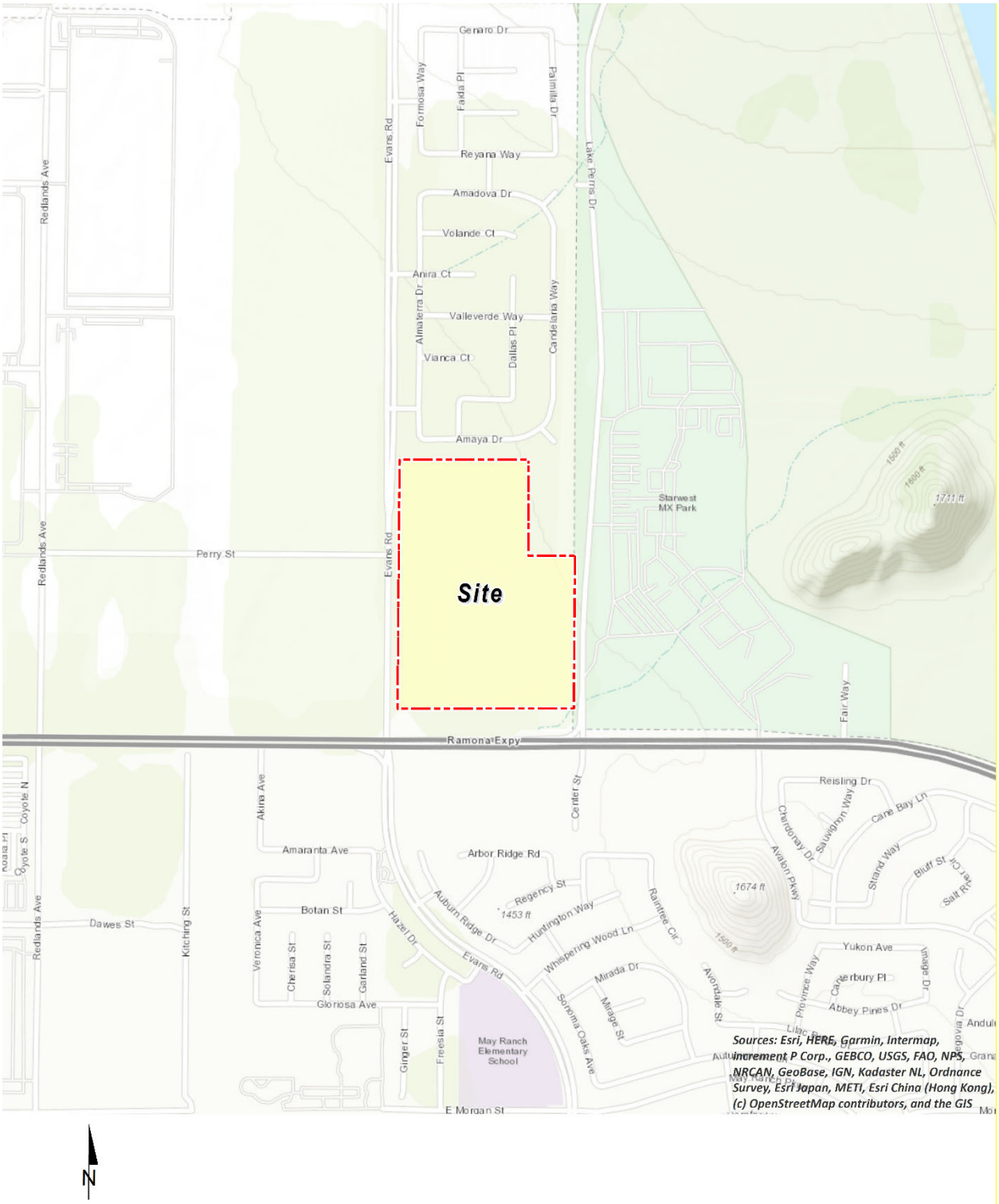
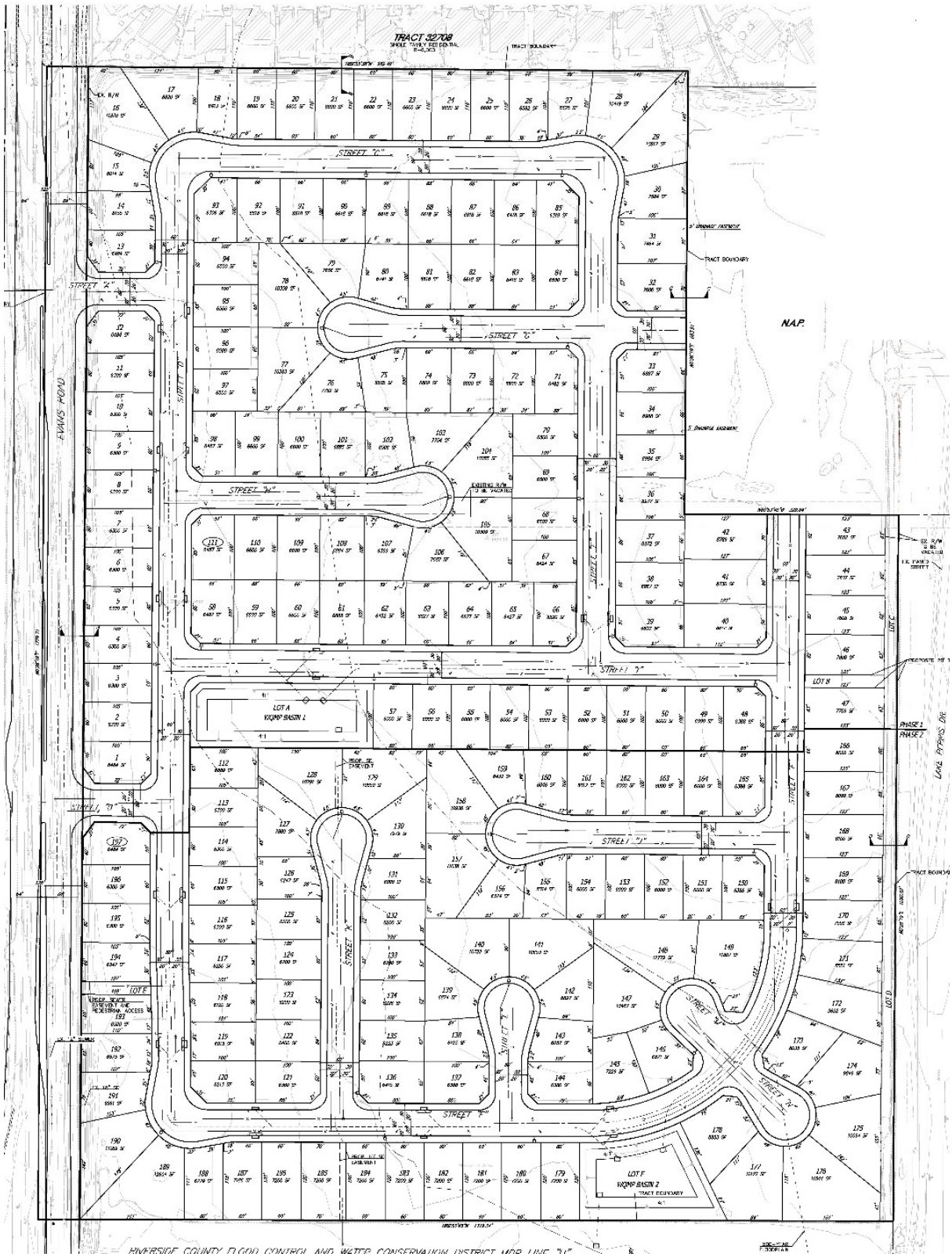


EXHIBIT 1-B: SITE PLAN



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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 (CO_2), methane (CH_4), nitrous oxide (N_2O), 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, CO_2, N_2O, CH_4, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). 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 CO_2, CH_4, and N_2O 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	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. 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	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.	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.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	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).		

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
CO_2	CO_2 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, CO_2 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 CO_2 in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (13).	CO_2 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. CO_2 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).	Outdoor levels of CO_2 are not high enough to result in negative health effects. According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of CO_2 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 CO_2 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).
CH_4	CH_4 is an extremely effective absorber of radiation, although its atmospheric concentration is less than	CH_4 has both natural and anthropogenic sources. It is released as part	CH_4 is extremely reactive with oxidizers, halogens, and other halogen-containing

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	CO_2 and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs.	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 CH_4. Other anthropocentric sources include fossil-fuel combustion and biomass burning (16).	compounds. Exposure to high levels of CH_4 can cause asphyxiation, loss of consciousness, headache and dizziness, nausea and vomiting, weakness, loss of coordination, and an increased breathing rate.
N_2O	N_2O, also known as laughing gas, is a colorless GHG. Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb).	N_2O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some	N_2O 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).

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
		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. N_2O can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction (17).	
Chlorofluorocarbons (CFCs)	CFCs are gases formed synthetically by replacing all hydrogen atoms in CH_4 or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically	CFCs have no natural source but were first synthesized in 1928. They were used for refrigerants,	In confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
	unreactive in the troposphere (the level of air at the earth's surface).	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).	high or too low) or asphyxiation.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
HFCs	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 (CHF_3), 1,1,1,2-tetrafluoroethane (CH_2FCF), and 1,1-difluoroethane (CH_3CF_2). Prior to 1990, the only significant emissions were of CHF_3. CH_2FCF emissions are increasing due to its use as a refrigerant.	HFCs are manmade for applications such as automobile air conditioners and refrigerants.	No health effects are known to result from exposure to HFCs.
PFCs	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 (CF_4) and hexafluoroethane (C_2F_6). The EPA estimates	The two main sources of PFCs are primary aluminum production and semiconductor manufacture.	No health effects are known to result from exposure to PFCs.

TABLE 2-1: GREENHOUSE GASES

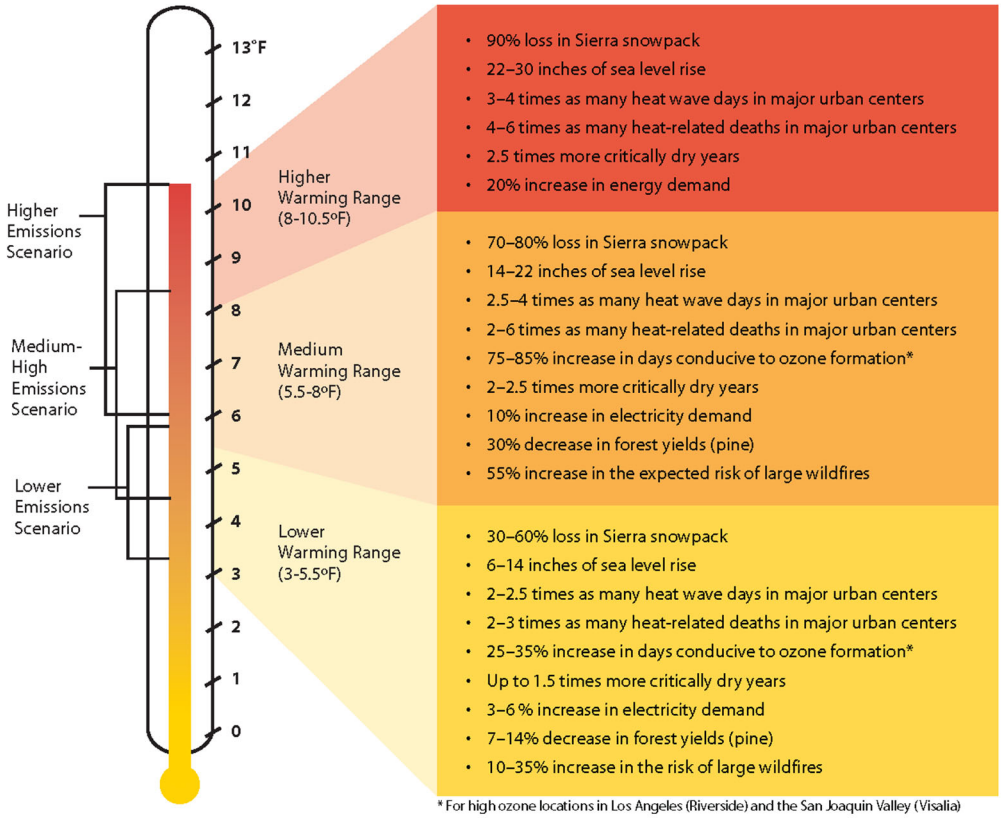
Greenhouse Gases	Description	Sources	Health Effects
	that concentrations of CF_4 in the atmosphere are over 70 parts per trillion (ppt).		
SF_6	SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900) (19). The EPA indicates that concentrations in the 1990s were about 4 ppt.	SF_6 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.	In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

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 CO_2, CH_4, and N_2O 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)



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. CO_2 is utilized as the reference gas for GWP, and thus has a GWP of 1. CO_2 equivalent (CO_2e) is a term used for describing the difference GHGs in a common unit. CO_2e signifies the amount of CO_2 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 CO_2 to 23,900 for SF_6 and GWP for the IPCC's 5th Assessment Report range from 1 for CO_2 to 23,500 for SF_6 (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	5th Assessment Report
CO_2	See*	1	1
CH_4	12 .4	21	28
N_2O	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 CO_2e higher than 2017 levels and 6 MMT CO2e below the 2020 GHG Limit of 431 MMT CO2e. (MMT CO_2e/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 CO_2 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 CO_2, 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— CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—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 CO_2 per mile, equivalent to 35.5 miles per gallon (mpg) if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards would cut CO_2 emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the 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 CO_2 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 CO_2 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 CO_2 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 exiting Corporate Average Fuel Economy (CAFE) and tailpipe CO_2 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 CO_2 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 CO_2 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 CO_2 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 CO_2 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 N_2O 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 CO_2 emissions from power plants, auctions CO_2 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 met[1]). GHGs as defined under AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. 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).

CARB Scoping Plan Update. 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 CH_4 emissions from agricultural and other wastes.

The *Final 2017 Scoping Plan Update* establishes a new emissions limit of 260 MMT CO_2e 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 (CH_4, 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 CO_2e (26). This is less than the 2020 emissions target of 431 MMT CO_2e.

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 CH_4 and hydroflurocarbon 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 CO_2e (MT CO_2e) or less per capita by 2030 and 2 MT CO_2e 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 CO_2e per year (MT CO_2e/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 CO_2e/yr must comply with the Cap-and-Trade Program. Triggering of the 25.000 MT CO_2e/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 CO_2e 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.

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 (37).

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 CO_2e. 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. CCR Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 version of Title 24 was adopted by the CEC and became effective on January 1, 2020.

The 2019 Title 24 standards require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, update indoor and outdoor lighting for nonresidential buildings. Single-family homes built with the 2019 standards will use approximately 7% less energy compared to the residential homes built under the 2016 standards. Additionally, after implementation of solar photovoltaic systems, homes built under the 2019 standards will about 53% less energy than homes built under the 2016 standards. Nonresidential buildings will use approximately 30% less energy due to lighting upgrades (38).

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, 2011, and is administered by the California Building Standards Commission (BSC). CALGreen is updated on a regular basis along with the rest of Title 24, with the most recent update is the 2019 CALGreen edition. 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 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 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. 2019 CALGreen standards are applicable to the Project and require (39):

- During site development one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site (4.106.2).
    - Retention basins of sufficient size shall be utilized to retain storm water on the site.
    - Where storm water is conveyed to a public drainage system, collection point, gutter or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.
    - Compliance with a lawfully enacted storm water management ordinance.
- Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings (4.106.3).
- New residential construction shall facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) (4.106.4).

  - For one- and two-family dwelling units and townhomes with attached garages, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit for each dwelling unit (4.106.4.1).
  - Where 17 or more multifamily dwelling units are constructed on a building site, 3 percent of the total number of parking spaces provided for all types of parking facilities, but in no case less than one, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number (4.106.4.2).
    - Construction documents shall indicate the location of proposed EV spaces. At least one EV space shall be located in common use areas and available for use by all residents. (4.106.4.2.1)
  - All newly constructed hotels and motels shall provide EV spaces capable of supporting future installation of EVSE. The construction documents shall identify the location of the EV spaces.
    - The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Table 4.106.4.3.1. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number (4.106.4.3.1).

- Comply with Title 24, Part 6 energy efficiency standards (4.201.1).
- 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 (4.303.1.1)
  - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (4.303.1.2).
  - Showerheads. Single showerheads shall have a minimum flow rate of not more than 1.8 gallons per minute and 80 psi (4.303.1.3.1). 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 (4.303.1.3.2).
  - Faucets and fountains. Residential lavatory faucets shall have a maximum flow rate of note 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 note 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. Residential developments with an aggregate area equal to or greater than 500 square feet 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 (4.304.1).

- Newly constructed residential developments, where disinfected tertiary recycled water is available from a municipal source to a construction site, may be required to have recycled water supply systems installed, allowing the use of recycled water for residential landscape irrigation systems (4.305.1).
- Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with Section 4.401.1, 4.408.2; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the following shall be placed in the building (4.410.1):
    - Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.
    - Operation and maintenance instructions for the following:
    - Equipment and appliances, including water-saving devices and systems, HVAC systems, photovoltaic systems, electric vehicle chargers, water-heating systems and other major appliances and equipment.
    - Roof and yard drainage, including gutters and downspouts.
    - Space conditioning systems, including condensers and air filters.
    - Landscape irrigation systems.
    - Water reuse systems.
    - Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations.
    - Public transportation and/or carpool options available in the area.
    - Educational material on the positive impacts of an interior relative humidity between 30—60 percent and what methods an occupant may use to maintain the relative humidity level in that range.
    - Information about water-conserving landscape and irrigation design and controllers which conserve water.
    - Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation.
    - Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc.
    - Information about state solar energy and incentive programs available.
    - A copy of all special inspection verifications required by the enforcing agency or this code.
- Recycling by Occupants. Where 5 or more multi-family dwelling units, 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 (4.410.2).

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 (40).

REGIONAL

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

SCAQMD

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, 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. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008. The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by the lead agency in adopting its own threshold. The current interim thresholds consist of 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:
    - Residential and Commercial land use: 3,000 MT CO_2e/yr
    - Industrial land use: 10,000 MT CO_2e/yr
    - Based on land use type: residential: 3,500 MT CO_2e/yr; commercial: 1,400 MT CO_2e/yr; or mixed use: 3,000 MT CO_2e/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 CO_2e/SP/year for projects and 6.6 MT CO_2e/SP/year for plans;

  - Option 3, 2035 target: 3.0 MT CO_2e/SP/year for projects and 4.1 MT CO_2e/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 CO_2 concentrations at 450 ppm, thus stabilizing global climate.

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 (41). 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

The City of Perris has not adopted its own numeric threshold of significance for determining impacts with respect to project level GHG emissions. However, an acceptable approach, for small projects, is using a screening threshold of 3,000 MT CO_2e/yr to determine if additional analysis is

required. 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 (42). 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 CO_2e/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."* (43)

Thus, and based on guidance from the SCAQMD, if a non-industrial project would emit GHGs less than 3,000 MT CO_2e 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 non-industrial project would emit GHGs in excess of 3,000 MT CO_2e/yr, then the project could be considered a substantial GHG emitter, which would require additional analysis and potentially mitigation.

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 (44):

- 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

On October 17, 2017, the SCAQMD, in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model (CalEEMod) Version 2016.3.2[2]. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOC, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (45). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine GHG emissions. Output from the model runs for construction and operational activity are provided in Appendices 3.1. CalEEMod includes GHG emissions from the following source categories: construction, area, energy, mobile, waste, water. CalEEMod outputs are included in appendix 3.1.

3.3.1 EMISSION FACTORS MODEL

On August 19, 2019, the EPA approved the 2017 version of the EMissions FACtor model (EMFAC) web database for use in State Implementation Plan and transportation conformity analyses. EMFAC2017 is a mathematical model that was developed to calculate emission rates, fuel consumption, vehicle miles traveled (VMT) from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the CARB to project changes in future emissions from on-road mobile sources (46). This GHGA utilizes annual EMFAC2017

[2] In late June 2021, and subsequent to the modeling and preparation of this analysis, CAPCOA released CalEEMod version 2020.4.0, which incorporates EMFAC2017 emission factors including N20, the effects of the federal SAFE Rule, the 2019 Energy Code, updated electricity intensity factors to account for RPS though 2019, and updated trip generation factors. Other improvements were related to specific air districts and the user interface. Based on Urban Crossroads experience, these emission estimates presented in this report exceed the emissions estimate from the newer model and are thus conservative and do not discount project impacts.

emission factors in order to derive vehicle emissions associated with Project operational activities. EMFAC2017 emission factors are provided in Appendix 3.2.

Because the EMFAC2017 emission rates are associated with vehicle fuel types while CalEEMod vehicle emission factors are aggregated to include all fuel types for each individual vehicle class, the EMFAC2017 emission rates for different fuel types of a vehicle class are averaged by activity or by population and activity to derive CalEEMod emission factors. The equations applied to obtain CalEEMod vehicle emission factors for each emission type are detailed in CalEEMod User's Guide *Appendix A: Calculation Details for CalEEMod* (47).

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 (48). 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 (49). Additionally, the science to calculate life cycle emissions is not yet established or well defined; therefore, SCAQMD has not recommended, and is not requiring, life-cycle emissions analysis.

3.5 CONSTRUCTION EMISSIONS

The Project is anticipated to be constructed in two phases, with 111 single family detached residential dwelling units constructed in the first phase and the remaining 86 single family detached residential dwelling units be constructed in Phase 2. Phase 1 is anticipated to have an opening year of 2023, and Phase 2 is anticipated to have an opening year of 2027. However, to be conservative, the Project construction schedule is compressed and modeled as a single phase with an opening year of 2023 for all 197 single family detached residential dwelling units.

Project construction actvities would generate CO_2 and CH_4 emissions The report *Stratford Ranch East Air Quality Impact Analysis Report* (AQIA) contains detailed information regarding Project construction activities (50). 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 May 2022 and will last through June 2023. 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 stringent[3]. The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per *CEQA Guidelines*. The duration of construction activity was based on the 2023 opening year.

TABLE 3-1: CONSTRUCTION DURATION

Phase Name	Start Date	End Date	Days
Site Preparation	5/1/2022	6/10/2022	30
Grading	6/11/2022	9/23/2022	75
Building Construction	9/24/2022	6/30/2023	200
Architectural Coating	4/10/2023	6/30/2023	60
Paving	4/17/2023	6/30/2023	55

Source: CalEEMod 2016, Appendix 3.1.

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 2016.3.2 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.

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 (51). 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.

[3] As shown in the CalEEMod User's Guide Version 2016.3.2, 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.

TABLE 3-2: CONSTRUCTION EQUIPMENT ASSUMPTIONS

Phase Name	Equipment	Amount	Hours Per Day
Site Preparation	Crawler Tractors	4	8
Site Preparation	Rubber Tired Dozers	3	8
Grading	Crawler Tractors	2	8
Grading	Excavators	2	8
Grading	Graders	1	8
Grading	Rubber Tired Dozers	1	8
Grading	Scrapers	2	8
Building Construction	Aerial Lifts	1	8
Building Construction	Cranes	1	8
Building Construction	Forklifts	7	8
Building Construction	Generator Sets	6	8
Building Construction	Tractors/Loaders/Backhoes	10	8
Paving	Pavers	2	8
Paving	Paving Equipment	2	8
Paving	Rollers	2	8
Architectural Coating	Air Compressors	2	6

Source: CalEEMod 2016, Appendix 3.1

TABLE 3-3 AMORTIZED ANNUAL CONSTRUCTION EMISSIONS

Year	Emissions (MT/yr)			
	CO_2	CH_4	N_2O	Total CO_2e
2022	576.09	0.14	0.00	579.57
2023	654.37	0.12	0.00	657.44
Total Annual Construction Emissions	1,230.46	0.26	0.00	1,237.01
Amortized Construction Emissions ($MTCO_2e$)	**41.02**	**0.01**	**0.00**	**41.23**

Source: CalEEMod 2016, Appendix 3.1

3.6 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO_2, CH_4, and N_2O from the following primary sources:

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

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, shedders/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 CO_2 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 lighting[4]. GHGs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions. Unless otherwise noted, CalEEMod default parameters were used.

RENEWABLE PORTFOLIO STANDARD

Indirect emissions from electricity use were modeled based on electricity intensity factors for the project utility provider, Southern California Edison (SCE). CalEEMOD derives energy intensity factors from SCE's 2012 California Public Utilities Commission 2011 Renewables Portfolio Standard Quarterly Report, which indicates that in 2012 SCE generated 705 pounds of CO_2e for each megawatt-hour (MWh) of electricity delivered. Projected 2023 energy-intensity factors for SCE were interpolated based on SCE's existing power mix and the requirements of the Renewables Portfolio Standard. As SCE had a power mix with 20.6 percent renewables in 2012 and is projected to have 41.3 percent renewables in 2023 (52), the projected 2023 energy intensity factor is expected to be approximately 20.7 percent less than the 2012 energy intensity factor included in CalEEMod.

TITLE 24 ENERGY EFFICIENCY STANDARDS

California's Energy Efficiency Standards for Residential and Nonresidential Buildings was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity. The 2019 version of Title 24 was adopted by the CEC and became effective on January 1, 2020.

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

4

the Project. The Project-related GHG impacts are derived primarily from vehicle trips generated by the Project. Trip characteristics available from the TIA report were utilized in this analysis (53).

Additionally, as discussed in Section E.3, the project includes a Project design feature that will install a minimum of 5 residential EV charging stations in the garages of five separate residences. 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 3.3.

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.

3.7 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 2,984.22 MT CO_2e/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 2,984.22 MT CO_2/yr; the proposed Project would not exceed the SCAQMD/City's screening threshold of 3,000 MT CO_2e/yr. 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_2O	Total CO_2e
Annual construction-related emissions amortized over 30 years	41.02	0.01	0.00	41.23
Area	50.63	0.00	0.00	50.99
Energy	525.87	0.02	0.01	528.30
EV Charger - Energy Demand	--	--	--	8.33
Mobile	2,212.51	0.07	0.00	2,214.19
EV Charger - Fuel Reduction	--	--	--	-37.44
Waste	46.86	2.77	0.00	116.08
Water Use	51.64	0.34	0.01	62.54
Total CO_2e (All Sources)	**2,984.22**			

Source: CalEEMod 2016, Appendix 3.1

-- = Emission factor only provided in MT CO_2e

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 *CEQA Guidelines*, a lead agency may rely on qualitative analysis or performance-based standards to determine the significance of impacts from GHG emissions (44). As such, the Project's consistency with SB 32 (2017 Scoping Plan), is discussed below. It Consistency with AB 32 and the 2008 Scoping Plan is not necessary, since the target year for AB 32 and the 2008 Scoping Plan was 2020, and the Project's buildout year for modeling is 2023. As such the 2017 Scoping Plan is the most relevant statewide plan. Project consistency with SB 32 and City's General Plan Measures, Energy Efficiency, and CAS is evaluated in the following discussion.

SB 32/2017 SCOPING PLAN CONSISTENCY

The 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. Table 3-5 summarizes the project's consistency with the 2017 Scoping Plan. As summarized, the project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
Implement SB 350 by 2030		
Increase the Renewables Portfolio Standard to 50% of retail sales by 2030 and ensure grid reliability.	CPUC, CEC, CARB	Consistent. This measure is not directly applicable to development projects, but the proposed Project would use energy from Southern California Edison, which has committed to diversify its portfolio of energy sources by increasing energy from wind and solar sources.
Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.		Consistent. Although this measure is directed towards policymakers, the proposed Project would be designed consistent with Title 24 2019, which requires on-site renewable energy for residential development under 3 stories as well as increases in overall energy efficiency from Title 24 2016.

[5] Measures can be found at the following link: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in Integrated Resource Planning (IRP) to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly- owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs.		Consistent. Although this measure is directed towards policymakers, the proposed Project would be designed with on-site renewable energy.
Implement Mobile Source Strategy (Cleaner Technology and Fuels)		
At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025.	CARB, California State Transportation Agency (CalSTA), Strategic Growth Council (SGC), California Department of Transportation (Caltrans), CEC, OPR, Local Agencies	Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
At least 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030.		Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean cars regulations.		Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
Medium- and Heavy-Duty GHG Phase 2.		Consistent. These are CARB enforced standards; vehicles that access the Project that are required to comply with the standards will comply with the strategy.
Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20% of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100% of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel		Not applicable. This measure is not within the purview of this Project.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
buses, starting in 2020, meet the optional heavy-duty low-NO_X standard.		
Last Mile Delivery: New regulation that would result in the use of low NO_X or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5% of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10% in 2025 and remaining flat through 2030.		Not applicable. This Project is not responsible for implementation of SB 375 and would therefore not conflict with this measure.
Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion."		Not applicable. This Project is not responsible for implementation of SB 375 and would therefore not conflict with this measure.
Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).	CARB	Not applicable. The Project is not within the purview of SB 375 and would therefore not conflict with this measure.
By 2019, adjust performance measures used to select and design transportation facilities		
Harmonize project performance with emissions reductions and increase competitiveness of transit and active transportation modes (e.g., via guideline documents, funding programs, project selection, etc.).	CalSTA, SGC, OPR, CARB, Governor's Office of Business and Economic Development (GO-Biz), California Infrastructure and Economic Development Bank (IBank),	Not applicable. Although this is directed towards CARB and Caltrans, the proposed Project would be designed to promote and support pedestrian activity on-site and in the Project Site area.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
	Department of Finance (DOF), California Transportation Commission (CTC), Caltrans	
By 2019, develop pricing policies to support low-GHG transportation (e.g., low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts).	CalSTA, Caltrans, CTC, OPR, SGC, CARB	Not applicable. Although this measure is directed towards policymakers, the proposed Project would comply with AB 939, which sets a statewide policy that not less than 65% of solid waste generated be source reduced, recycled, or composted. Additionally, the proposed Project would be required to participate in the City's recycling program and recycling collection. During construction, the proposed Project shall recycle and reuse construction and demolition waste per City solid waste procedures.
Implement California Sustainable Freight Action Plan		
Improve freight system efficiency.	CalSTA, CalEPA, CNRA, CARB, Caltrans, CEC, GO-Biz	Not applicable. This measure is not within the purview of this Project.
Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030.		Not applicable. This measure is not within the purview of this Project.
Adopt a Low Carbon Fuel Standard with a Carbon Intensity reduction of 18%.	CARB	This measure would apply to all fuel purchased and used by the Project in the state.
Implement the Short-Lived Climate Pollutant Strategy by 2030		
40% reduction in methane and hydrofluorocarbon emissions below 2013 levels.	CARB, CalRecycle, CDFA, SWRCB,	Not applicable. This measure is not within the purview of this Project.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
50% reduction in black carbon emissions below 2013 levels.	Local Air Districts	Not applicable. This measure is not within the purview of this Project.
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	CARB, CalRecycle, CDFA SWRCB, Local Air Districts	Not applicable. This measure is not within the purview of this Project.
Implement the post-2020 Cap-and-Trade Program with declining annual caps.	CARB	Not applicable. This measure is not within the purview of this Project.
By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink		
Protect land from conversion through conservation easements and other incentives.	CNRA, Departments Within CDFA, CalEPA, CARB	Not applicable. This measure is not within the purview of this Project.
Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity		Not applicable. This measure is not within the purview of this Project.
Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments		Not applicable. This measure is not within the purview of this Project.
Establish scenario projections to serve as the foundation for the Implementation Plan		Not applicable. This measure is not within the purview of this Project.
Establish a carbon accounting framework for natural and working lands as described in SB 859 by 2018	CARB	Not applicable. This measure is not within the purview of this Project.
Implement Forest Carbon Plan	CNRA, California Department of Forestry and Fire Protection (CAL FIRE), CalEPA and Departments Within	Not applicable. This measure is not within the purview of this Project.

TABLE 3-5: 2017 SCOPING PLAN CONSISTENCY SUMMARY[5]

Action	Responsible Parties	Consistency
Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	State Agencies & Local Agencies	Not applicable. This measure is not within the purview of this Project.

As shown above, the Project would not conflict with any of the 2017 Scoping Plan elements as any regulations adopted would apply directly or indirectly to the Project. Further, recent studies show that the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40% below 1990 levels by 2030 (33).

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 will install solar PV systems on each residence, per Title 24 requirements. The Project is located along a Riverside Transit Agency's Bus Route 9 and would install 5 residential EV Charging stations. 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 2019 Building and Energy Efficiency Standards and the 2019 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 GHG study report represent an accurate depiction of the GHG impacts associated with the proposed Stratford Ranch East Project. The information contained in this GHG report is based on the best available data at the time of preparation. If you have any questions, please contact me directly (619) 778-1971.

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EDUCATION

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
APA – American Planning Association
AWMA – Air and Waste Management Association

PROFESSIONAL CERTIFICATIONS

HARP Model Training – Bluescape Environmental • 2004
Air Dispersion Modeling – Lakes Environmental • 2008

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APPENDIX 3.1:
CALEEMOD EMISSIONS MODEL OUTPUTS

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Stratford Ranch Residential - TTM 38071

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	197.00	Dwelling Unit	48.62	354,600.00	563

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	518.69	**CH4 Intensity (lb/MWhr)**	0.021	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SEC will have 41.33% renewables in 2023 = CO2: 518.69, CH4: 0.0214, and N20; 0.0046 lbs/MWh

Land Use - Based on Project plan 2/24/21

Construction Phase - Building construction revised based to meet a mid 2023 opening year, paving and architectural coating overlapped with building construction to represent a reasonable worst case condition

Off-road Equipment - standard 8 hour day, double equipment

Off-road Equipment - No welders, replaced with genset, tractor increase equipment to account for shortened building schedule, standard 8-hour schedule

Off-road Equipment - Tractor/loader/backhoe replaced with crawler tractor for PM generation, crawler HP and load factor adjusted to represent Tractor/Loaders/Backhoes

Off-road Equipment - No Change

Off-road Equipment - Tractor/loader/backhoe replaced with crawler tractor for PM generation, crawler HP and load factor adjusted to represent Tractor/Loaders/Backhoes

Grading - The entire site that would be graded and is 48.62 acres, only 53 CY will be exported, project site plan

Architectural Coating -

Vehicle Trips - Based on TIA

Vehicle Emission Factors - EMFAC2017 with Adjustment Factors for Safe Rule

Vehicle Emission Factors - EMFAC2017 with Adjustment Factors for Safe Rule

Vehicle Emission Factors - EMFAC2017 with Adjustment Factors for Safe Rule

Woodstoves - SACQMD Rule 445 No Wood Burning FP below 3,000' AMSL

Energy Use - Accounts for 53% increase in efficency over 2016 building code.

Water And Wastewater - Accounts for 2019 Greenbuilding code and MWELO

Construction Off-road Equipment Mitigation - SCAQMD Rule 403 requires watering of site 3x daily, porject will be required to install trackout, reduction taken from Rule 403 mitigation tables and use Tier 3 equipment during site prep and grading

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	46
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	740.00	200.00
tblConstructionPhase	NumDays	55.00	60.00
tblEnergyUse	LightingElect	1,608.84	756.15
tblEnergyUse	T24E	951.67	447.28
tblEnergyUse	T24NG	24,566.15	11,546.09
tblFireplaces	NumberGas	167.45	197.00
tblFireplaces	NumberNoFireplace	19.70	0.00
tblFireplaces	NumberWood	9.85	0.00
tblFleetMix	HHD	0.03	0.04
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.20	0.20
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	5.8250e-003	5.8570e-003
tblFleetMix	MCY	4.8760e-003	4.9030e-003
tblFleetMix	MDV	0.12	0.12
tblFleetMix	MH	8.6800e-004	0.00
tblFleetMix	MHD	0.02	0.02
tblFleetMix	OBUS	2.1230e-003	0.00
tblFleetMix	SBUS	7.1000e-004	0.00
tblFleetMix	UBUS	1.7800e-003	0.00

tblGrading	AcresOfGrading	262.50	48.62
tblGrading	AcresOfGrading	60.00	48.62
tblGrading	MaterialExported	0.00	53.00
tblLandUse	LotAcreage	63.96	48.62
tblOffRoadEquipment	HorsePower	212.00	97.00
tblOffRoadEquipment	HorsePower	212.00	97.00
tblOffRoadEquipment	HorsePower	63.00	46.00
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	LoadFactor	0.31	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	7.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	10.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.021
tblProjectCharacteristics	CO2IntensityFactor	702.44	518.69
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblVehicleEF	HHD	0.55	0.02
tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.68	6.43
tblVehicleEF	HHD	0.89	0.24
tblVehicleEF	HHD	2.88	4.3850e-003
tblVehicleEF	HHD	4,676.01	1,065.92
tblVehicleEF	HHD	1,529.62	1,272.83

tblVehicleEF	HHD	9.29	0.04
tblVehicleEF	HHD	14.62	5.31
tblVehicleEF	HHD	1.78	1.96
tblVehicleEF	HHD	9.0010e-003	2.3650e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.9470e-003	0.02
tblVehicleEF	HHD	7.9000e-005	0.00
tblVehicleEF	HHD	8.6120e-003	2.2630e-003
tblVehicleEF	HHD	0.03	0.03
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tblVehicleEF	HHD	3.9810e-003	9.7000e-005
tblVehicleEF	HHD	0.43	0.44
tblVehicleEF	HHD	7.0000e-005	2.0000e-006
tblVehicleEF	HHD	0.08	0.02
tblVehicleEF	HHD	3.1400e-004	4.4400e-004
tblVehicleEF	HHD	0.07	1.0000e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.4000e-004	0.00
tblVehicleEF	HHD	9.8000e-005	3.0000e-006
tblVehicleEF	HHD	3.9810e-003	9.7000e-005
tblVehicleEF	HHD	0.50	0.50
tblVehicleEF	HHD	7.0000e-005	2.0000e-006

tblVehicleEF	HHD	0.17	0.05
tblVehicleEF	HHD	3.1400e-004	4.4400e-004
tblVehicleEF	HHD	0.07	1.0000e-006
tblVehicleEF	HHD	0.52	0.02
tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.22	6.35
tblVehicleEF	HHD	0.89	0.24
tblVehicleEF	HHD	2.73	4.1390e-003
tblVehicleEF	HHD	4,953.81	1,052.83
tblVehicleEF	HHD	1,529.62	1,272.83
tblVehicleEF	HHD	9.29	0.04
tblVehicleEF	HHD	15.09	5.06
tblVehicleEF	HHD	1.68	1.85
tblVehicleEF	HHD	7.5890e-003	2.0780e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.9470e-003	0.02
tblVehicleEF	HHD	7.9000e-005	0.00
tblVehicleEF	HHD	7.2610e-003	1.9880e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8170e-003	8.8060e-003
tblVehicleEF	HHD	5.6890e-003	0.02
tblVehicleEF	HHD	7.3000e-005	0.00
tblVehicleEF	HHD	1.5700e-004	5.0000e-006
tblVehicleEF	HHD	4.1620e-003	1.0600e-004
tblVehicleEF	HHD	0.40	0.46

tblVehicleEF	HHD	1.0800e-004	3.0000e-006
tblVehicleEF	HHD	0.08	0.02
tblVehicleEF	HHD	3.0700e-004	4.4900e-004
tblVehicleEF	HHD	0.06	1.0000e-006
tblVehicleEF	HHD	0.05	9.8850e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.3800e-004	0.00
tblVehicleEF	HHD	1.5700e-004	5.0000e-006
tblVehicleEF	HHD	4.1620e-003	1.0600e-004
tblVehicleEF	HHD	0.48	0.53
tblVehicleEF	HHD	1.0800e-004	3.0000e-006
tblVehicleEF	HHD	0.17	0.05
tblVehicleEF	HHD	3.0700e-004	4.4900e-004
tblVehicleEF	HHD	0.07	1.0000e-006
tblVehicleEF	HHD	0.59	0.02
tblVehicleEF	HHD	0.08	8.2000e-004
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	2.32	6.51
tblVehicleEF	HHD	0.89	0.15
tblVehicleEF	HHD	2.90	4.3390e-003
tblVehicleEF	HHD	4,292.37	1,077.40
tblVehicleEF	HHD	1,529.62	1,253.68
tblVehicleEF	HHD	9.29	0.04
tblVehicleEF	HHD	13.97	5.62
tblVehicleEF	HHD	1.75	1.92
tblVehicleEF	HHD	0.01	2.7000e-003
tblVehicleEF	HHD	0.06	0.06

tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.9470e-003	0.02
tblVehicleEF	HHD	7.9000e-005	0.00
tblVehicleEF	HHD	0.01	2.5830e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8170e-003	8.7520e-003
tblVehicleEF	HHD	5.6890e-003	0.02
tblVehicleEF	HHD	7.3000e-005	0.00
tblVehicleEF	HHD	9.1000e-005	3.0000e-006
tblVehicleEF	HHD	4.2250e-003	1.0800e-004
tblVehicleEF	HHD	0.46	0.40
tblVehicleEF	HHD	6.7000e-005	2.0000e-006
tblVehicleEF	HHD	0.08	0.02
tblVehicleEF	HHD	3.4100e-004	4.7200e-004
tblVehicleEF	HHD	0.07	1.0000e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	1.4000e-004	0.00
tblVehicleEF	HHD	9.1000e-005	3.0000e-006
tblVehicleEF	HHD	4.2250e-003	1.0800e-004
tblVehicleEF	HHD	0.54	0.46
tblVehicleEF	HHD	6.7000e-005	2.0000e-006
tblVehicleEF	HHD	0.17	0.02
tblVehicleEF	HHD	3.4100e-004	4.7200e-004
tblVehicleEF	HHD	0.07	1.0000e-006
tblVehicleEF	LDA	4.2620e-003	1.8870e-003
tblVehicleEF	LDA	4.4750e-003	0.04

tblVehicleEF	LDA	0.57	0.56
tblVehicleEF	LDA	1.00	2.03
tblVehicleEF	LDA	253.24	251.70
tblVehicleEF	LDA	54.67	52.26
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	1.9480e-003	1.3050e-003
tblVehicleEF	LDA	2.2420e-003	1.7590e-003
tblVehicleEF	LDA	1.7950e-003	1.2020e-003
tblVehicleEF	LDA	2.0620e-003	1.6170e-003
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	6.9510e-003
tblVehicleEF	LDA	0.04	0.19
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	2.5360e-003	2.4590e-003
tblVehicleEF	LDA	5.6300e-004	5.1100e-004
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.09	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	0.04	0.19
tblVehicleEF	LDA	0.07	0.21
tblVehicleEF	LDA	4.5690e-003	2.1290e-003
tblVehicleEF	LDA	3.9690e-003	0.04
tblVehicleEF	LDA	0.64	0.67
tblVehicleEF	LDA	0.86	1.70

tblVehicleEF	LDA	266.82	272.11
tblVehicleEF	LDA	54.67	51.65
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	1.9480e-003	1.3050e-003
tblVehicleEF	LDA	2.2420e-003	1.7590e-003
tblVehicleEF	LDA	1.7950e-003	1.2020e-003
tblVehicleEF	LDA	2.0620e-003	1.6170e-003
tblVehicleEF	LDA	0.06	0.09
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.05	0.07
tblVehicleEF	LDA	0.01	7.7540e-003
tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.05	0.16
tblVehicleEF	LDA	2.6730e-003	2.6590e-003
tblVehicleEF	LDA	5.6100e-004	5.0500e-004
tblVehicleEF	LDA	0.06	0.09
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.05	0.07
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	0.03	0.19
tblVehicleEF	LDA	0.06	0.18
tblVehicleEF	LDA	4.1700e-003	1.8550e-003
tblVehicleEF	LDA	4.5790e-003	0.04
tblVehicleEF	LDA	0.55	0.54
tblVehicleEF	LDA	1.03	2.01
tblVehicleEF	LDA	248.85	248.26
tblVehicleEF	LDA	54.67	52.24

tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	1.9480e-003	1.3050e-003
tblVehicleEF	LDA	2.2420e-003	1.7590e-003
tblVehicleEF	LDA	1.7950e-003	1.2020e-003
tblVehicleEF	LDA	2.0620e-003	1.6170e-003
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	6.8280e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	2.4920e-003	2.4260e-003
tblVehicleEF	LDA	5.6400e-004	5.1000e-004
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.02	9.9310e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.21
tblVehicleEF	LDT1	0.01	5.7490e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.36	1.22
tblVehicleEF	LDT1	2.49	2.28
tblVehicleEF	LDT1	319.06	298.87
tblVehicleEF	LDT1	67.76	63.71
tblVehicleEF	LDT1	0.13	0.10
tblVehicleEF	LDT1	2.9770e-003	1.8930e-003

tblVehicleEF	LDT1	3.2520e-003	2.5560e-003
tblVehicleEF	LDT1	2.7410e-003	1.7420e-003
tblVehicleEF	LDT1	2.9900e-003	2.3500e-003
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.25	0.22
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.16	0.73
tblVehicleEF	LDT1	0.17	0.37
tblVehicleEF	LDT1	3.2070e-003	2.9210e-003
tblVehicleEF	LDT1	7.2100e-004	6.2300e-004
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.25	0.23
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.16	0.74
tblVehicleEF	LDT1	0.19	0.40
tblVehicleEF	LDT1	0.01	6.4140e-003
tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	1.50	1.44
tblVehicleEF	LDT1	2.12	1.91
tblVehicleEF	LDT1	334.98	320.06
tblVehicleEF	LDT1	67.76	62.93
tblVehicleEF	LDT1	0.11	0.09
tblVehicleEF	LDT1	2.9770e-003	1.8930e-003
tblVehicleEF	LDT1	3.2520e-003	2.5560e-003
tblVehicleEF	LDT1	2.7410e-003	1.7420e-003

tblVehicleEF	LDT1	2.9900e-003	2.3500e-003
tblVehicleEF	LDT1	0.21	0.30
tblVehicleEF	LDT1	0.27	0.26
tblVehicleEF	LDT1	0.15	0.22
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.15	0.72
tblVehicleEF	LDT1	0.15	0.31
tblVehicleEF	LDT1	3.3680e-003	3.1280e-003
tblVehicleEF	LDT1	7.1500e-004	6.1500e-004
tblVehicleEF	LDT1	0.21	0.30
tblVehicleEF	LDT1	0.27	0.26
tblVehicleEF	LDT1	0.15	0.22
tblVehicleEF	LDT1	0.05	0.04
tblVehicleEF	LDT1	0.15	0.72
tblVehicleEF	LDT1	0.16	0.34
tblVehicleEF	LDT1	0.01	5.6560e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.31	1.18
tblVehicleEF	LDT1	2.56	2.26
tblVehicleEF	LDT1	313.74	295.29
tblVehicleEF	LDT1	67.76	63.68
tblVehicleEF	LDT1	0.12	0.10
tblVehicleEF	LDT1	2.9770e-003	1.8930e-003
tblVehicleEF	LDT1	3.2520e-003	2.5560e-003
tblVehicleEF	LDT1	2.7410e-003	1.7420e-003
tblVehicleEF	LDT1	2.9900e-003	2.3500e-003
tblVehicleEF	LDT1	0.12	0.16

tblVehicleEF	LDT1	0.28	0.26
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.19	0.86
tblVehicleEF	LDT1	0.17	0.36
tblVehicleEF	LDT1	3.1530e-003	2.8860e-003
tblVehicleEF	LDT1	7.2200e-004	6.2200e-004
tblVehicleEF	LDT1	0.12	0.16
tblVehicleEF	LDT1	0.28	0.26
tblVehicleEF	LDT1	0.10	0.11
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.19	0.86
tblVehicleEF	LDT1	0.19	0.40
tblVehicleEF	LDT2	5.9480e-003	3.1840e-003
tblVehicleEF	LDT2	5.6730e-003	0.06
tblVehicleEF	LDT2	0.75	0.79
tblVehicleEF	LDT2	1.24	2.59
tblVehicleEF	LDT2	356.06	314.22
tblVehicleEF	LDT2	75.77	67.26
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	1.9880e-003	1.3480e-003
tblVehicleEF	LDT2	2.3560e-003	1.7950e-003
tblVehicleEF	LDT2	1.8280e-003	1.2410e-003
tblVehicleEF	LDT2	2.1660e-003	1.6510e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.07

tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.08	0.28
tblVehicleEF	LDT2	3.5660e-003	3.0700e-003
tblVehicleEF	LDT2	7.7800e-004	6.5700e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.07
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.08	0.31
tblVehicleEF	LDT2	6.3690e-003	3.5750e-003
tblVehicleEF	LDT2	5.0330e-003	0.05
tblVehicleEF	LDT2	0.83	0.94
tblVehicleEF	LDT2	1.06	2.16
tblVehicleEF	LDT2	374.47	334.38
tblVehicleEF	LDT2	75.77	66.44
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	1.9880e-003	1.3480e-003
tblVehicleEF	LDT2	2.3560e-003	1.7950e-003
tblVehicleEF	LDT2	1.8280e-003	1.2410e-003
tblVehicleEF	LDT2	2.1660e-003	1.6510e-003
tblVehicleEF	LDT2	0.07	0.15
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	0.06	0.39

tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.7510e-003	3.2670e-003
tblVehicleEF	LDT2	7.7500e-004	6.4900e-004
tblVehicleEF	LDT2	0.07	0.15
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.07	0.27
tblVehicleEF	LDT2	5.8200e-003	3.1320e-003
tblVehicleEF	LDT2	5.8050e-003	0.06
tblVehicleEF	LDT2	0.72	0.76
tblVehicleEF	LDT2	1.27	2.57
tblVehicleEF	LDT2	349.95	310.81
tblVehicleEF	LDT2	75.77	67.23
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	1.9880e-003	1.3480e-003
tblVehicleEF	LDT2	2.3560e-003	1.7950e-003
tblVehicleEF	LDT2	1.8280e-003	1.2410e-003
tblVehicleEF	LDT2	2.1660e-003	1.6510e-003
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.04	0.07
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.46
tblVehicleEF	LDT2	0.08	0.28
tblVehicleEF	LDT2	3.5050e-003	3.0370e-003

tblVehicleEF	LDT2	7.7900e-004	6.5700e-004
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.04	0.07
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.46
tblVehicleEF	LDT2	0.09	0.31
tblVehicleEF	LHD1	5.2150e-003	4.5410e-003
tblVehicleEF	LHD1	9.8020e-003	4.4200e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.17
tblVehicleEF	LHD1	0.74	0.60
tblVehicleEF	LHD1	2.42	0.89
tblVehicleEF	LHD1	9.02	9.36
tblVehicleEF	LHD1	594.74	619.96
tblVehicleEF	LHD1	31.51	9.99
tblVehicleEF	LHD1	0.07	0.08
tblVehicleEF	LHD1	1.09	1.39
tblVehicleEF	LHD1	8.6400e-004	1.0130e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	9.8040e-003	0.01
tblVehicleEF	LHD1	8.9300e-004	2.1100e-004
tblVehicleEF	LHD1	8.2600e-004	9.6900e-004
tblVehicleEF	LHD1	2.5390e-003	2.5170e-003
tblVehicleEF	LHD1	9.3560e-003	9.8330e-003
tblVehicleEF	LHD1	8.2100e-004	1.9400e-004
tblVehicleEF	LHD1	3.0350e-003	2.3920e-003

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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.8020e-003	1.2620e-003
tblVehicleEF	LHD1	0.06	0.05
tblVehicleEF	LHD1	0.30	0.44
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	5.8330e-003	6.0260e-003
tblVehicleEF	LHD1	3.6000e-004	9.9000e-005
tblVehicleEF	LHD1	3.0350e-003	2.3920e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.8020e-003	1.2620e-003
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	0.30	0.44
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD1	5.2150e-003	4.5540e-003
tblVehicleEF	LHD1	0.01	4.4900e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.17
tblVehicleEF	LHD1	0.75	0.61
tblVehicleEF	LHD1	2.30	0.84
tblVehicleEF	LHD1	9.02	9.36
tblVehicleEF	LHD1	594.74	619.98
tblVehicleEF	LHD1	31.51	9.91
tblVehicleEF	LHD1	0.07	0.08
tblVehicleEF	LHD1	1.02	1.31
tblVehicleEF	LHD1	8.6400e-004	1.0130e-003

tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	9.8040e-003	0.01
tblVehicleEF	LHD1	8.9300e-004	2.1100e-004
tblVehicleEF	LHD1	8.2600e-004	9.6900e-004
tblVehicleEF	LHD1	2.5390e-003	2.5170e-003
tblVehicleEF	LHD1	9.3560e-003	9.8330e-003
tblVehicleEF	LHD1	8.2100e-004	1.9400e-004
tblVehicleEF	LHD1	4.7330e-003	4.2440e-003
tblVehicleEF	LHD1	0.10	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.7000e-003	2.4050e-003
tblVehicleEF	LHD1	0.06	0.05
tblVehicleEF	LHD1	0.29	0.44
tblVehicleEF	LHD1	0.23	0.06
tblVehicleEF	LHD1	5.8330e-003	6.0260e-003
tblVehicleEF	LHD1	3.5800e-004	9.8000e-005
tblVehicleEF	LHD1	4.7330e-003	4.2440e-003
tblVehicleEF	LHD1	0.10	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.7000e-003	2.4050e-003
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	0.29	0.44
tblVehicleEF	LHD1	0.25	0.07
tblVehicleEF	LHD1	5.2150e-003	4.5430e-003
tblVehicleEF	LHD1	9.7560e-003	4.4280e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.17

tblVehicleEF	LHD1	0.73	0.60
tblVehicleEF	LHD1	2.43	0.88
tblVehicleEF	LHD1	9.02	9.36
tblVehicleEF	LHD1	594.74	619.96
tblVehicleEF	LHD1	31.51	9.98
tblVehicleEF	LHD1	0.07	0.08
tblVehicleEF	LHD1	1.07	1.37
tblVehicleEF	LHD1	8.6400e-004	1.0130e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	9.8040e-003	0.01
tblVehicleEF	LHD1	8.9300e-004	2.1100e-004
tblVehicleEF	LHD1	8.2600e-004	9.6900e-004
tblVehicleEF	LHD1	2.5390e-003	2.5170e-003
tblVehicleEF	LHD1	9.3560e-003	9.8330e-003
tblVehicleEF	LHD1	8.2100e-004	1.9400e-004
tblVehicleEF	LHD1	3.0640e-003	2.4970e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.7650e-003	1.3210e-003
tblVehicleEF	LHD1	0.06	0.05
tblVehicleEF	LHD1	0.32	0.47
tblVehicleEF	LHD1	0.24	0.07
tblVehicleEF	LHD1	5.8330e-003	6.0260e-003
tblVehicleEF	LHD1	3.6100e-004	9.9000e-005
tblVehicleEF	LHD1	3.0640e-003	2.4970e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03

tblVehicleEF	LHD1	1.7650e-003	1.3210e-003
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	0.32	0.47
tblVehicleEF	LHD1	0.26	0.07
tblVehicleEF	LHD2	3.6920e-003	2.7700e-003
tblVehicleEF	LHD2	3.6770e-003	3.2640e-003
tblVehicleEF	LHD2	7.3690e-003	7.1780e-003
tblVehicleEF	LHD2	0.13	0.13
tblVehicleEF	LHD2	0.32	0.44
tblVehicleEF	LHD2	1.21	0.48
tblVehicleEF	LHD2	13.71	14.92
tblVehicleEF	LHD2	607.87	614.92
tblVehicleEF	LHD2	26.42	6.42
tblVehicleEF	LHD2	0.09	0.12
tblVehicleEF	LHD2	0.68	1.52
tblVehicleEF	LHD2	1.1660e-003	1.5130e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.0030e-003	0.01
tblVehicleEF	LHD2	4.2200e-004	9.8000e-005
tblVehicleEF	LHD2	1.1160e-003	1.4470e-003
tblVehicleEF	LHD2	2.6680e-003	2.7370e-003
tblVehicleEF	LHD2	8.6000e-003	0.01
tblVehicleEF	LHD2	3.8800e-004	9.1000e-005
tblVehicleEF	LHD2	1.0790e-003	1.1190e-003
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	6.9700e-004	6.1300e-004

tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.07	0.19
tblVehicleEF	LHD2	0.10	0.04
tblVehicleEF	LHD2	1.3400e-004	1.4200e-004
tblVehicleEF	LHD2	5.9190e-003	5.9160e-003
tblVehicleEF	LHD2	2.8600e-004	6.4000e-005
tblVehicleEF	LHD2	1.0790e-003	1.1190e-003
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	6.9700e-004	6.1300e-004
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.19
tblVehicleEF	LHD2	0.11	0.04
tblVehicleEF	LHD2	3.6920e-003	2.7770e-003
tblVehicleEF	LHD2	3.7200e-003	3.2860e-003
tblVehicleEF	LHD2	7.1240e-003	6.9030e-003
tblVehicleEF	LHD2	0.13	0.13
tblVehicleEF	LHD2	0.32	0.45
tblVehicleEF	LHD2	1.16	0.45
tblVehicleEF	LHD2	13.71	14.92
tblVehicleEF	LHD2	607.87	614.93
tblVehicleEF	LHD2	26.42	6.38
tblVehicleEF	LHD2	0.09	0.12
tblVehicleEF	LHD2	0.64	1.43
tblVehicleEF	LHD2	1.1660e-003	1.5130e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.0030e-003	0.01

tblVehicleEF	LHD2	4.2200e-004	9.8000e-005
tblVehicleEF	LHD2	1.1160e-003	1.4470e-003
tblVehicleEF	LHD2	2.6680e-003	2.7370e-003
tblVehicleEF	LHD2	8.6000e-003	0.01
tblVehicleEF	LHD2	3.8800e-004	9.1000e-005
tblVehicleEF	LHD2	1.6790e-003	1.9920e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	1.0330e-003	1.1680e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.07	0.20
tblVehicleEF	LHD2	0.10	0.03
tblVehicleEF	LHD2	1.3400e-004	1.4200e-004
tblVehicleEF	LHD2	5.9190e-003	5.9160e-003
tblVehicleEF	LHD2	2.8500e-004	6.3000e-005
tblVehicleEF	LHD2	1.6790e-003	1.9920e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.0330e-003	1.1680e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.07	0.20
tblVehicleEF	LHD2	0.11	0.04
tblVehicleEF	LHD2	3.6920e-003	2.7710e-003
tblVehicleEF	LHD2	3.6660e-003	3.2670e-003
tblVehicleEF	LHD2	7.4110e-003	7.1290e-003
tblVehicleEF	LHD2	0.13	0.13
tblVehicleEF	LHD2	0.32	0.44

tblVehicleEF	LHD2	1.22	0.47
tblVehicleEF	LHD2	13.71	14.92
tblVehicleEF	LHD2	607.87	614.92
tblVehicleEF	LHD2	26.42	6.42
tblVehicleEF	LHD2	0.09	0.12
tblVehicleEF	LHD2	0.67	1.49
tblVehicleEF	LHD2	1.1660e-003	1.5130e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.0030e-003	0.01
tblVehicleEF	LHD2	4.2200e-004	9.8000e-005
tblVehicleEF	LHD2	1.1160e-003	1.4470e-003
tblVehicleEF	LHD2	2.6680e-003	2.7370e-003
tblVehicleEF	LHD2	8.6000e-003	0.01
tblVehicleEF	LHD2	3.8800e-004	9.1000e-005
tblVehicleEF	LHD2	1.0460e-003	1.1350e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	6.6900e-004	6.3500e-004
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.08	0.21
tblVehicleEF	LHD2	0.10	0.03
tblVehicleEF	LHD2	1.3400e-004	1.4200e-004
tblVehicleEF	LHD2	5.9190e-003	5.9160e-003
tblVehicleEF	LHD2	2.8600e-004	6.3000e-005
tblVehicleEF	LHD2	1.0460e-003	1.1350e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	6.6900e-004	6.3500e-004
tblVehicleEF	LHD2	0.05	0.06
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tblVehicleEF	LHD2	0.11	0.04
tblVehicleEF	MCY	0.51	0.31
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.57	18.85
tblVehicleEF	MCY	9.66	8.64
tblVehicleEF	MCY	183.25	207.60
tblVehicleEF	MCY	44.44	60.36
tblVehicleEF	MCY	1.13	1.13
tblVehicleEF	MCY	2.3160e-003	1.7970e-003
tblVehicleEF	MCY	3.5910e-003	2.7750e-003
tblVehicleEF	MCY	2.1630e-003	1.6800e-003
tblVehicleEF	MCY	3.3760e-003	2.6090e-003
tblVehicleEF	MCY	1.17	1.43
tblVehicleEF	MCY	0.66	0.79
tblVehicleEF	MCY	0.69	0.76
tblVehicleEF	MCY	2.45	2.11
tblVehicleEF	MCY	0.59	1.77
tblVehicleEF	MCY	2.04	1.83
tblVehicleEF	MCY	2.2100e-003	2.0540e-003
tblVehicleEF	MCY	6.6200e-004	5.9700e-004
tblVehicleEF	MCY	1.17	1.43
tblVehicleEF	MCY	0.66	0.79
tblVehicleEF	MCY	0.69	0.76
tblVehicleEF	MCY	3.06	2.61

tblVehicleEF	MCY	0.59	1.77
tblVehicleEF	MCY	2.22	2.00
tblVehicleEF	MCY	0.50	0.31
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.11	18.83
tblVehicleEF	MCY	8.87	7.90
tblVehicleEF	MCY	183.25	207.41
tblVehicleEF	MCY	44.44	58.44
tblVehicleEF	MCY	0.98	0.97
tblVehicleEF	MCY	2.3160e-003	1.7970e-003
tblVehicleEF	MCY	3.5910e-003	2.7750e-003
tblVehicleEF	MCY	2.1630e-003	1.6800e-003
tblVehicleEF	MCY	3.3760e-003	2.6090e-003
tblVehicleEF	MCY	1.97	2.75
tblVehicleEF	MCY	0.78	1.09
tblVehicleEF	MCY	1.23	1.72
tblVehicleEF	MCY	2.40	2.07
tblVehicleEF	MCY	0.56	1.74
tblVehicleEF	MCY	1.82	1.61
tblVehicleEF	MCY	2.2010e-003	2.0530e-003
tblVehicleEF	MCY	6.4300e-004	5.7800e-004
tblVehicleEF	MCY	1.97	2.75
tblVehicleEF	MCY	0.78	1.09
tblVehicleEF	MCY	1.23	1.72
tblVehicleEF	MCY	3.00	2.56
tblVehicleEF	MCY	0.56	1.74
tblVehicleEF	MCY	1.98	1.75

tblVehicleEF	MCY	0.51	0.31
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.59	18.30
tblVehicleEF	MCY	9.77	8.43
tblVehicleEF	MCY	183.25	206.64
tblVehicleEF	MCY	44.44	59.88
tblVehicleEF	MCY	1.10	1.09
tblVehicleEF	MCY	2.3160e-003	1.7970e-003
tblVehicleEF	MCY	3.5910e-003	2.7750e-003
tblVehicleEF	MCY	2.1630e-003	1.6800e-003
tblVehicleEF	MCY	3.3760e-003	2.6090e-003
tblVehicleEF	MCY	1.25	1.64
tblVehicleEF	MCY	0.85	1.05
tblVehicleEF	MCY	0.66	0.76
tblVehicleEF	MCY	2.46	2.09
tblVehicleEF	MCY	0.68	2.02
tblVehicleEF	MCY	2.07	1.79
tblVehicleEF	MCY	2.2110e-003	2.0450e-003
tblVehicleEF	MCY	6.6500e-004	5.9300e-004
tblVehicleEF	MCY	1.25	1.64
tblVehicleEF	MCY	0.85	1.05
tblVehicleEF	MCY	0.66	0.76
tblVehicleEF	MCY	3.07	2.59
tblVehicleEF	MCY	0.68	2.02
tblVehicleEF	MCY	2.25	1.95
tblVehicleEF	MDV	0.01	4.1640e-003
tblVehicleEF	MDV	0.01	0.08

tblVehicleEF	MDV	1.17	0.92
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tblVehicleEF	MDV	483.05	396.16
tblVehicleEF	MDV	101.29	84.06
tblVehicleEF	MDV	0.13	0.09
tblVehicleEF	MDV	2.0950e-003	1.4100e-003
tblVehicleEF	MDV	2.4110e-003	1.8510e-003
tblVehicleEF	MDV	1.9310e-003	1.3010e-003
tblVehicleEF	MDV	2.2170e-003	1.7020e-003
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.16	0.15
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.09	0.46
tblVehicleEF	MDV	0.17	0.38
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tblVehicleEF	MDV	1.0530e-003	8.2200e-004
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.16	0.15
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.09	0.46
tblVehicleEF	MDV	0.19	0.41
tblVehicleEF	MDV	0.01	4.6800e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	1.30	1.09
tblVehicleEF	MDV	1.97	2.49

tblVehicleEF	MDV	507.73	417.66
tblVehicleEF	MDV	101.29	83.09
tblVehicleEF	MDV	0.11	0.08
tblVehicleEF	MDV	2.0950e-003	1.4100e-003
tblVehicleEF	MDV	2.4110e-003	1.8510e-003
tblVehicleEF	MDV	1.9310e-003	1.3010e-003
tblVehicleEF	MDV	2.2170e-003	1.7020e-003
tblVehicleEF	MDV	0.12	0.19
tblVehicleEF	MDV	0.16	0.17
tblVehicleEF	MDV	0.11	0.17
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.09	0.45
tblVehicleEF	MDV	0.15	0.32
tblVehicleEF	MDV	5.0860e-003	4.0790e-003
tblVehicleEF	MDV	1.0470e-003	8.1200e-004
tblVehicleEF	MDV	0.12	0.19
tblVehicleEF	MDV	0.16	0.17
tblVehicleEF	MDV	0.11	0.17
tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.09	0.45
tblVehicleEF	MDV	0.17	0.35
tblVehicleEF	MDV	0.01	4.0920e-003
tblVehicleEF	MDV	0.01	0.08
tblVehicleEF	MDV	1.12	0.88
tblVehicleEF	MDV	2.36	2.97
tblVehicleEF	MDV	474.94	392.53
tblVehicleEF	MDV	101.29	84.03

tblVehicleEF	MDV	0.12	0.08
tblVehicleEF	MDV	2.0950e-003	1.4100e-003
tblVehicleEF	MDV	2.4110e-003	1.8510e-003
tblVehicleEF	MDV	1.9310e-003	1.3010e-003
tblVehicleEF	MDV	2.2170e-003	1.7020e-003
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.11	0.52
tblVehicleEF	MDV	0.18	0.38
tblVehicleEF	MDV	4.7550e-003	3.8330e-003
tblVehicleEF	MDV	1.0540e-003	8.2100e-004
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.11	0.52
tblVehicleEF	MDV	0.19	0.41
tblVehicleEF	MH	0.02	3.2740e-003
tblVehicleEF	MH	0.02	0.00
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tblVehicleEF	MH	5.12	0.00
tblVehicleEF	MH	1,098.66	929.33
tblVehicleEF	MH	58.67	0.00
tblVehicleEF	MH	1.14	4.27
tblVehicleEF	MH	0.01	0.02

tblVehicleEF	MH	0.02	0.14
tblVehicleEF	MH	1.0060e-003	0.00
tblVehicleEF	MH	3.2200e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.13
tblVehicleEF	MH	9.2500e-004	0.00
tblVehicleEF	MH	0.95	0.00
tblVehicleEF	MH	0.06	0.00
tblVehicleEF	MH	0.39	0.00
tblVehicleEF	MH	0.07	0.07
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.30	0.00
tblVehicleEF	MH	0.01	8.7850e-003
tblVehicleEF	MH	6.7600e-004	0.00
tblVehicleEF	MH	0.95	0.00
tblVehicleEF	MH	0.06	0.00
tblVehicleEF	MH	0.39	0.00
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.32	0.00
tblVehicleEF	MH	0.02	3.2740e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.79	0.33
tblVehicleEF	MH	4.82	0.00
tblVehicleEF	MH	1,098.66	929.33
tblVehicleEF	MH	58.67	0.00
tblVehicleEF	MH	1.05	4.03
tblVehicleEF	MH	0.01	0.02

tblVehicleEF	MH	0.02	0.14
tblVehicleEF	MH	1.0060e-003	0.00
tblVehicleEF	MH	3.2200e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.13
tblVehicleEF	MH	9.2500e-004	0.00
tblVehicleEF	MH	1.47	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.60	0.00
tblVehicleEF	MH	0.07	0.07
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.28	0.00
tblVehicleEF	MH	0.01	8.7850e-003
tblVehicleEF	MH	6.7100e-004	0.00
tblVehicleEF	MH	1.47	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.60	0.00
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.31	0.00
tblVehicleEF	MH	0.02	3.2740e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.73	0.33
tblVehicleEF	MH	5.17	0.00
tblVehicleEF	MH	1,098.66	929.33
tblVehicleEF	MH	58.67	0.00
tblVehicleEF	MH	1.12	4.20
tblVehicleEF	MH	0.01	0.02

tblVehicleEF	MH	0.02	0.14
tblVehicleEF	MH	1.0060e-003	0.00
tblVehicleEF	MH	3.2200e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.13
tblVehicleEF	MH	9.2500e-004	0.00
tblVehicleEF	MH	1.03	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.40	0.00
tblVehicleEF	MH	0.07	0.07
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.30	0.00
tblVehicleEF	MH	0.01	8.7850e-003
tblVehicleEF	MH	6.7700e-004	0.00
tblVehicleEF	MH	1.03	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.40	0.00
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.33	0.00
tblVehicleEF	MHD	0.02	2.7550e-003
tblVehicleEF	MHD	3.3510e-003	8.7300e-004
tblVehicleEF	MHD	0.05	7.0300e-003
tblVehicleEF	MHD	0.34	0.33
tblVehicleEF	MHD	0.28	0.12
tblVehicleEF	MHD	5.31	0.81
tblVehicleEF	MHD	138.31	67.29
tblVehicleEF	MHD	1,125.72	911.02

tblVehicleEF	MHD	59.27	7.21
tblVehicleEF	MHD	0.37	0.40
tblVehicleEF	MHD	0.70	0.91
tblVehicleEF	MHD	1.0200e-004	4.3400e-004
tblVehicleEF	MHD	2.8090e-003	9.4670e-003
tblVehicleEF	MHD	7.6600e-004	8.3000e-005
tblVehicleEF	MHD	9.7000e-005	4.1500e-004
tblVehicleEF	MHD	2.6840e-003	9.0550e-003
tblVehicleEF	MHD	7.0500e-004	7.6000e-005
tblVehicleEF	MHD	1.0820e-003	4.1800e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	6.9100e-004	2.2800e-004
tblVehicleEF	MHD	0.03	9.5450e-003
tblVehicleEF	MHD	0.02	0.07
tblVehicleEF	MHD	0.33	0.04
tblVehicleEF	MHD	1.3310e-003	6.3800e-004
tblVehicleEF	MHD	0.01	8.6560e-003
tblVehicleEF	MHD	6.8600e-004	7.1000e-005
tblVehicleEF	MHD	1.0820e-003	4.1800e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	6.9100e-004	2.2800e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.07
tblVehicleEF	MHD	0.36	0.04
tblVehicleEF	MHD	0.01	2.6270e-003

tblVehicleEF	MHD	3.3970e-003	8.8800e-004
tblVehicleEF	MHD	0.04	6.7570e-003
tblVehicleEF	MHD	0.25	0.29
tblVehicleEF	MHD	0.28	0.12
tblVehicleEF	MHD	5.04	0.76
tblVehicleEF	MHD	146.49	67.24
tblVehicleEF	MHD	1,125.72	911.02
tblVehicleEF	MHD	59.27	7.14
tblVehicleEF	MHD	0.38	0.39
tblVehicleEF	MHD	0.66	0.86
tblVehicleEF	MHD	8.6000e-005	3.6900e-004
tblVehicleEF	MHD	2.8090e-003	9.4670e-003
tblVehicleEF	MHD	7.6600e-004	8.3000e-005
tblVehicleEF	MHD	8.2000e-005	3.5300e-004
tblVehicleEF	MHD	2.6840e-003	9.0550e-003
tblVehicleEF	MHD	7.0500e-004	7.6000e-005
tblVehicleEF	MHD	1.6890e-003	7.5100e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	1.0300e-003	4.4600e-004
tblVehicleEF	MHD	0.03	9.6090e-003
tblVehicleEF	MHD	0.02	0.07
tblVehicleEF	MHD	0.31	0.04
tblVehicleEF	MHD	1.4080e-003	6.3800e-004
tblVehicleEF	MHD	0.01	8.6560e-003
tblVehicleEF	MHD	6.8100e-004	7.1000e-005
tblVehicleEF	MHD	1.6890e-003	7.5100e-004

tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.0300e-003	4.4600e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.07
tblVehicleEF	MHD	0.34	0.04
tblVehicleEF	MHD	0.02	2.9460e-003
tblVehicleEF	MHD	3.3370e-003	8.7400e-004
tblVehicleEF	MHD	0.05	6.9640e-003
tblVehicleEF	MHD	0.47	0.39
tblVehicleEF	MHD	0.28	0.12
tblVehicleEF	MHD	5.36	0.80
tblVehicleEF	MHD	126.99	67.35
tblVehicleEF	MHD	1,125.72	911.02
tblVehicleEF	MHD	59.27	7.20
tblVehicleEF	MHD	0.35	0.41
tblVehicleEF	MHD	0.68	0.89
tblVehicleEF	MHD	1.2400e-004	5.2400e-004
tblVehicleEF	MHD	2.8090e-003	9.4670e-003
tblVehicleEF	MHD	7.6600e-004	8.3000e-005
tblVehicleEF	MHD	1.1900e-004	5.0100e-004
tblVehicleEF	MHD	2.6840e-003	9.0550e-003
tblVehicleEF	MHD	7.0500e-004	7.6000e-005
tblVehicleEF	MHD	1.0540e-003	4.3600e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	6.6300e-004	2.3900e-004

tblVehicleEF	MHD	0.03	9.5510e-003
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.33	0.04
tblVehicleEF	MHD	1.2250e-003	6.3800e-004
tblVehicleEF	MHD	0.01	8.6560e-003
tblVehicleEF	MHD	6.8600e-004	7.1000e-005
tblVehicleEF	MHD	1.0540e-003	4.3600e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	6.6300e-004	2.3900e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.08
tblVehicleEF	MHD	0.36	0.04
tblVehicleEF	OBUS	0.01	8.5220e-003
tblVehicleEF	OBUS	6.0000e-003	5.4050e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.49
tblVehicleEF	OBUS	0.44	0.70
tblVehicleEF	OBUS	5.22	2.68
tblVehicleEF	OBUS	91.95	64.37
tblVehicleEF	OBUS	1,222.80	1,335.49
tblVehicleEF	OBUS	68.36	21.28
tblVehicleEF	OBUS	0.19	0.23
tblVehicleEF	OBUS	0.63	0.91
tblVehicleEF	OBUS	1.8000e-005	7.5000e-005
tblVehicleEF	OBUS	2.5040e-003	8.4680e-003
tblVehicleEF	OBUS	8.5000e-004	2.1800e-004

tblVehicleEF	OBUS	1.7000e-005	7.2000e-005
tblVehicleEF	OBUS	2.3790e-003	8.0880e-003
tblVehicleEF	OBUS	7.8100e-004	2.0100e-004
tblVehicleEF	OBUS	1.5080e-003	2.6670e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	7.8700e-004	1.1770e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.04	0.29
tblVehicleEF	OBUS	0.33	0.13
tblVehicleEF	OBUS	8.8900e-004	6.1500e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7500e-004	2.1100e-004
tblVehicleEF	OBUS	1.5080e-003	2.6670e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	7.8700e-004	1.1770e-003
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.29
tblVehicleEF	OBUS	0.36	0.14
tblVehicleEF	OBUS	0.01	8.5920e-003
tblVehicleEF	OBUS	6.1100e-003	5.5390e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.24	0.48
tblVehicleEF	OBUS	0.45	0.72
tblVehicleEF	OBUS	4.93	2.49
tblVehicleEF	OBUS	96.41	63.70

tblVehicleEF	OBUS	1,222.80	1,335.52
tblVehicleEF	OBUS	68.36	20.96
tblVehicleEF	OBUS	0.20	0.21
tblVehicleEF	OBUS	0.59	0.84
tblVehicleEF	OBUS	1.5000e-005	6.7000e-005
tblVehicleEF	OBUS	2.5040e-003	8.4680e-003
tblVehicleEF	OBUS	8.5000e-004	2.1800e-004
tblVehicleEF	OBUS	1.4000e-005	6.4000e-005
tblVehicleEF	OBUS	2.3790e-003	8.0880e-003
tblVehicleEF	OBUS	7.8100e-004	2.0100e-004
tblVehicleEF	OBUS	2.2910e-003	4.6970e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.1730e-003	2.2650e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.04	0.29
tblVehicleEF	OBUS	0.31	0.12
tblVehicleEF	OBUS	9.3200e-004	6.0900e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7000e-004	2.0700e-004
tblVehicleEF	OBUS	2.2910e-003	4.6970e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	1.1730e-003	2.2650e-003
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.29
tblVehicleEF	OBUS	0.34	0.13

tblVehicleEF	OBUS	0.01	8.4630e-003
tblVehicleEF	OBUS	5.9720e-003	5.4160e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.49
tblVehicleEF	OBUS	0.44	0.70
tblVehicleEF	OBUS	5.27	2.67
tblVehicleEF	OBUS	85.78	65.29
tblVehicleEF	OBUS	1,222.80	1,335.50
tblVehicleEF	OBUS	68.36	21.26
tblVehicleEF	OBUS	0.18	0.24
tblVehicleEF	OBUS	0.62	0.89
tblVehicleEF	OBUS	2.1000e-005	8.7000e-005
tblVehicleEF	OBUS	2.5040e-003	8.4680e-003
tblVehicleEF	OBUS	8.5000e-004	2.1800e-004
tblVehicleEF	OBUS	2.0000e-005	8.3000e-005
tblVehicleEF	OBUS	2.3790e-003	8.0880e-003
tblVehicleEF	OBUS	7.8100e-004	2.0100e-004
tblVehicleEF	OBUS	1.5020e-003	2.7830e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	7.6600e-004	1.2510e-003
tblVehicleEF	OBUS	0.04	0.03
tblVehicleEF	OBUS	0.04	0.31
tblVehicleEF	OBUS	0.33	0.13
tblVehicleEF	OBUS	8.3000e-004	6.2400e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7600e-004	2.1000e-004

tblVehicleEF	OBUS	1.5020e-003	2.7830e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	7.6600e-004	1.2510e-003
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.31
tblVehicleEF	OBUS	0.36	0.14
tblVehicleEF	SBUS	0.83	0.09
tblVehicleEF	SBUS	0.01	6.6030e-003
tblVehicleEF	SBUS	0.06	8.0990e-003
tblVehicleEF	SBUS	8.04	3.43
tblVehicleEF	SBUS	0.70	0.55
tblVehicleEF	SBUS	7.18	1.08
tblVehicleEF	SBUS	1,118.19	369.74
tblVehicleEF	SBUS	1,082.51	1,096.55
tblVehicleEF	SBUS	55.02	6.92
tblVehicleEF	SBUS	8.69	3.32
tblVehicleEF	SBUS	3.91	4.42
tblVehicleEF	SBUS	8.2920e-003	3.3040e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.8500e-004	4.8000e-005
tblVehicleEF	SBUS	7.9330e-003	3.1610e-003
tblVehicleEF	SBUS	2.6760e-003	2.6500e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	7.2100e-004	4.4000e-005
tblVehicleEF	SBUS	3.6590e-003	1.5760e-003

tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	0.96	0.41
tblVehicleEF	SBUS	1.9290e-003	7.9200e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.01	0.07
tblVehicleEF	SBUS	0.38	0.05
tblVehicleEF	SBUS	0.01	3.5360e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7500e-004	6.9000e-005
tblVehicleEF	SBUS	3.6590e-003	1.5760e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	1.38	0.59
tblVehicleEF	SBUS	1.9290e-003	7.9200e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.01	0.07
tblVehicleEF	SBUS	0.42	0.05
tblVehicleEF	SBUS	0.83	0.09
tblVehicleEF	SBUS	0.01	6.6870e-003
tblVehicleEF	SBUS	0.06	6.7520e-003
tblVehicleEF	SBUS	7.94	3.39
tblVehicleEF	SBUS	0.71	0.56
tblVehicleEF	SBUS	5.72	0.77
tblVehicleEF	SBUS	1,168.50	378.98
tblVehicleEF	SBUS	1,082.51	1,096.56
tblVehicleEF	SBUS	55.02	6.42
tblVehicleEF	SBUS	8.97	3.40
tblVehicleEF	SBUS	3.68	4.16

tblVehicleEF	SBUS	6.9900e-003	2.7930e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.8500e-004	4.8000e-005
tblVehicleEF	SBUS	6.6880e-003	2.6720e-003
tblVehicleEF	SBUS	2.6760e-003	2.6500e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	7.2100e-004	4.4000e-005
tblVehicleEF	SBUS	5.6810e-003	2.7600e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	0.95	0.41
tblVehicleEF	SBUS	2.9530e-003	1.4670e-003
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.34	0.04
tblVehicleEF	SBUS	0.01	3.6240e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.5000e-004	6.3000e-005
tblVehicleEF	SBUS	5.6810e-003	2.7600e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	1.38	0.59
tblVehicleEF	SBUS	2.9530e-003	1.4670e-003
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.01	0.06
tblVehicleEF	SBUS	0.37	0.04
tblVehicleEF	SBUS	0.83	0.09
tblVehicleEF	SBUS	0.01	6.6020e-003

tblVehicleEF	SBUS	0.07	8.2440e-003
tblVehicleEF	SBUS	8.19	3.48
tblVehicleEF	SBUS	0.70	0.55
tblVehicleEF	SBUS	7.44	1.10
tblVehicleEF	SBUS	1,048.72	356.98
tblVehicleEF	SBUS	1,082.51	1,096.55
tblVehicleEF	SBUS	55.02	6.96
tblVehicleEF	SBUS	8.31	3.21
tblVehicleEF	SBUS	3.85	4.35
tblVehicleEF	SBUS	0.01	4.0110e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.8500e-004	4.8000e-005
tblVehicleEF	SBUS	9.6530e-003	3.8370e-003
tblVehicleEF	SBUS	2.6760e-003	2.6500e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	7.2100e-004	4.4000e-005
tblVehicleEF	SBUS	3.5200e-003	1.4840e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	0.96	0.41
tblVehicleEF	SBUS	1.8620e-003	8.1800e-004
tblVehicleEF	SBUS	0.10	0.09
tblVehicleEF	SBUS	0.02	0.08
tblVehicleEF	SBUS	0.39	0.05
tblVehicleEF	SBUS	0.01	3.4160e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7900e-004	6.9000e-005

tblVehicleEF	SBUS	3.5200e-003	1.4840e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	1.39	0.59
tblVehicleEF	SBUS	1.8620e-003	8.1800e-004
tblVehicleEF	SBUS	0.12	0.11
tblVehicleEF	SBUS	0.02	0.08
tblVehicleEF	SBUS	0.43	0.05
tblVehicleEF	UBUS	2.20	3.04
tblVehicleEF	UBUS	0.06	0.02
tblVehicleEF	UBUS	9.91	23.60
tblVehicleEF	UBUS	10.15	1.86
tblVehicleEF	UBUS	1,905.83	1,635.62
tblVehicleEF	UBUS	113.27	22.96
tblVehicleEF	UBUS	7.78	0.30
tblVehicleEF	UBUS	0.58	0.09
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.10	2.1820e-003
tblVehicleEF	UBUS	1.2130e-003	2.2400e-004
tblVehicleEF	UBUS	0.25	0.04
tblVehicleEF	UBUS	3.0000e-003	5.0570e-003
tblVehicleEF	UBUS	0.09	2.0670e-003
tblVehicleEF	UBUS	1.1150e-003	2.0600e-004
tblVehicleEF	UBUS	5.0170e-003	2.8050e-003
tblVehicleEF	UBUS	0.08	0.02
tblVehicleEF	UBUS	2.8810e-003	1.1470e-003
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	0.03	0.08

tblVehicleEF	UBUS	0.79	0.10
tblVehicleEF	UBUS	9.5330e-003	6.3200e-003
tblVehicleEF	UBUS	1.3160e-003	2.2700e-004
tblVehicleEF	UBUS	5.0170e-003	2.8050e-003
tblVehicleEF	UBUS	0.08	0.02
tblVehicleEF	UBUS	2.8810e-003	1.1470e-003
tblVehicleEF	UBUS	2.96	3.11
tblVehicleEF	UBUS	0.03	0.08
tblVehicleEF	UBUS	0.86	0.10
tblVehicleEF	UBUS	2.20	3.04
tblVehicleEF	UBUS	0.05	0.02
tblVehicleEF	UBUS	9.96	23.60
tblVehicleEF	UBUS	8.81	1.58
tblVehicleEF	UBUS	1,905.83	1,635.63
tblVehicleEF	UBUS	113.27	22.49
tblVehicleEF	UBUS	7.32	0.30
tblVehicleEF	UBUS	0.58	0.09
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.10	2.1820e-003
tblVehicleEF	UBUS	1.2130e-003	2.2400e-004
tblVehicleEF	UBUS	0.25	0.04
tblVehicleEF	UBUS	3.0000e-003	5.0570e-003
tblVehicleEF	UBUS	0.09	2.0670e-003
tblVehicleEF	UBUS	1.1150e-003	2.0600e-004
tblVehicleEF	UBUS	7.4730e-003	4.9810e-003
tblVehicleEF	UBUS	0.08	0.02
tblVehicleEF	UBUS	4.2880e-003	2.2660e-003

tblVehicleEF	UBUS	0.69	0.05
tblVehicleEF	UBUS	0.02	0.07
tblVehicleEF	UBUS	0.72	0.09
tblVehicleEF	UBUS	9.5340e-003	6.3200e-003
tblVehicleEF	UBUS	1.2930e-003	2.2300e-004
tblVehicleEF	UBUS	7.4730e-003	4.9810e-003
tblVehicleEF	UBUS	0.08	0.02
tblVehicleEF	UBUS	4.2880e-003	2.2660e-003
tblVehicleEF	UBUS	2.97	3.11
tblVehicleEF	UBUS	0.02	0.07
tblVehicleEF	UBUS	0.79	0.09
tblVehicleEF	UBUS	2.20	3.04
tblVehicleEF	UBUS	0.06	0.02
tblVehicleEF	UBUS	9.90	23.60
tblVehicleEF	UBUS	10.35	1.85
tblVehicleEF	UBUS	1,905.83	1,635.62
tblVehicleEF	UBUS	113.27	22.93
tblVehicleEF	UBUS	7.63	0.30
tblVehicleEF	UBUS	0.58	0.09
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.10	2.1820e-003
tblVehicleEF	UBUS	1.2130e-003	2.2400e-004
tblVehicleEF	UBUS	0.25	0.04
tblVehicleEF	UBUS	3.0000e-003	5.0570e-003
tblVehicleEF	UBUS	0.09	2.0670e-003
tblVehicleEF	UBUS	1.1150e-003	2.0600e-004
tblVehicleEF	UBUS	5.4520e-003	2.8430e-003

tblVehicleEF	UBUS	0.09	0.02
tblVehicleEF	UBUS	2.9590e-003	1.2010e-003
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	0.03	0.09
tblVehicleEF	UBUS	0.80	0.09
tblVehicleEF	UBUS	9.5330e-003	6.3200e-003
tblVehicleEF	UBUS	1.3200e-003	2.2700e-004
tblVehicleEF	UBUS	5.4520e-003	2.8430e-003
tblVehicleEF	UBUS	0.09	0.02
tblVehicleEF	UBUS	2.9590e-003	1.2010e-003
tblVehicleEF	UBUS	2.96	3.11
tblVehicleEF	UBUS	0.03	0.09
tblVehicleEF	UBUS	0.88	0.10
tblVehicleTrips	ST_TR	9.91	9.83
tblVehicleTrips	SU_TR	8.62	8.54
tblVehicleTrips	WD_TR	9.52	9.44
tblWater	IndoorWaterUseRate	12,835,343.05	10,268,274.44
tblWater	OutdoorWaterUseRate	8,091,846.70	6,473,477.36
tblWoodstoves	NumberCatalytic	9.85	0.00
tblWoodstoves	NumberNoncatalytic	9.85	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3981	3.8841	3.4913	6.5600e-003	0.5915	0.1945	0.7860	0.2902	0.1814	0.4716	0.0000	576.0865	576.0865	0.1392	0.0000	579.5668
2023	1.4631	3.2771	4.2946	7.4600e-003	0.0684	0.1560	0.2244	0.0184	0.1479	0.1662	0.0000	654.3713	654.3713	0.1229	0.0000	657.4441
Maximum	**1.4631**	**3.8841**	**4.2946**	**7.4600e-003**	**0.5915**	**0.1945**	**0.7860**	**0.2902**	**0.1814**	**0.4716**	**0.0000**	**654.3713**	**654.3713**	**0.1392**	**0.0000**	**657.4441**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2567	3.1316	3.7950	6.5600e-003	0.2402	0.1492	0.3894	0.1161	0.1448	0.2609	0.0000	576.0859	576.0859	0.1392	0.0000	579.5661
2023	1.4631	3.2771	4.2946	7.4600e-003	0.0417	0.1560	0.1977	0.0118	0.1479	0.1597	0.0000	654.3706	654.3706	0.1229	0.0000	657.4434
Maximum	**1.4631**	**3.2771**	**4.2946**	**7.4600e-003**	**0.2402**	**0.1560**	**0.3894**	**0.1161**	**0.1479**	**0.2609**	**0.0000**	**654.3706**	**654.3706**	**0.1392**	**0.0000**	**657.4434**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**7.60**	**10.51**	**-3.90**	**0.00**	**57.28**	**12.92**	**41.89**	**58.55**	**11.12**	**34.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-1-2022	7-31-2022	1.4768	0.8710
2	8-1-2022	10-31-2022	1.6265	1.3467
3	11-1-2022	1-31-2023	1.7319	1.7319
4	2-1-2023	4-30-2023	1.9349	1.9349
5	5-1-2023	7-31-2023	2.2001	2.2001
		Highest	2.2001	2.2001

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.4583	0.0643	2.0494	3.7000e-004		0.0146	0.0146		0.0146	0.0146	0.0000	50.6256	50.6256	4.1000e-003	8.7000e-004	50.9865
Energy	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	525.8721	525.8721	0.0174	6.6800e-003	528.2952
Mobile	0.7244	2.0756	6.9603	0.0236	2.3839	0.0190	2.4029	0.6369	0.0178	0.6547	0.0000	2,212.5112	2,212.5112	0.0670	0.0000	2,214.1858
Waste						0.0000	0.0000		0.0000	0.0000	46.8564	0.0000	46.8564	2.7691	0.0000	116.0848
Water						0.0000	0.0000		0.0000	0.0000	3.2577	48.3778	51.6355	0.3366	8.3700e-003	62.5426
Total	**2.2014**	**2.2994**	**9.0777**	**0.0250**	**2.3839**	**0.0464**	**2.4304**	**0.6369**	**0.0453**	**0.6821**	**50.1141**	**2,837.3867**	**2,887.5008**	**3.1941**	**0.0159**	**2,972.0947**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.4583	0.0643	2.0494	3.7000e-004		0.0146	0.0146		0.0146	0.0146	0.0000	50.6256	50.6256	4.1000e-003	8.7000e-004	50.9865
Energy	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	525.8721	525.8721	0.0174	6.6800e-003	528.2952
Mobile	0.7244	2.0756	6.9603	0.0236	2.3839	0.0190	2.4029	0.6369	0.0178	0.6547	0.0000	2,212.5112	2,212.5112	0.0670	0.0000	2,214.1858
Waste						0.0000	0.0000		0.0000	0.0000	46.8564	0.0000	46.8564	2.7691	0.0000	116.0848
Water						0.0000	0.0000		0.0000	0.0000	3.2577	48.3778	51.6355	0.3366	8.3700e-003	62.5426
Total	**2.2014**	**2.2994**	**9.0777**	**0.0250**	**2.3839**	**0.0464**	**2.4304**	**0.6369**	**0.0453**	**0.6821**	**50.1141**	**2,837.3867**	**2,887.5008**	**3.1941**	**0.0159**	**2,972.0947**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Stratford Ranch Residential - TTM 38071 - South Coast AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2022	6/10/2022	5	30	
2	Grading	Grading	6/11/2022	9/23/2022	5	75	
3	Building Construction	Building Construction	9/24/2022	6/30/2023	5	200	
4	Architectural Coating	Architectural Coating	4/10/2023	6/30/2023	5	60	
5	Paving	Paving	4/17/2023	6/30/2023	5	55	

Acres of Grading (Site Preparation Phase): 48.62

Acres of Grading (Grading Phase): 48.62

Acres of Paving: 0

Residential Indoor: 718,065; Residential Outdoor: 239,355; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Crawler Tractors	2	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Aerial Lifts	1	8.00	46	0.45
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	7	8.00	89	0.20
Building Construction	Generator Sets	6	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	10	8.00	97	0.37
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	7.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	25	71.00	21.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	14.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2968	0.0000	0.2968	0.1517	0.0000	0.1517	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0605	0.5895	0.3103	5.7000e-004		0.0343	0.0343		0.0315	0.0315	0.0000	50.1634	50.1634	0.0162	0.0000	50.5690
Total	**0.0605**	**0.5895**	**0.3103**	**5.7000e-004**	**0.2968**	**0.0343**	**0.3310**	**0.1517**	**0.0315**	**0.1833**	**0.0000**	**50.1634**	**50.1634**	**0.0162**	**0.0000**	**50.5690**

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.5000e-004	8.6900e-003	3.0000e-005	2.9600e-003	2.0000e-005	2.9800e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.4878	2.4878	6.0000e-005	0.0000	2.4893
Total	**1.0600e-003**	**7.5000e-004**	**8.6900e-003**	**3.0000e-005**	**2.9600e-003**	**2.0000e-005**	**2.9800e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.4878**	**2.4878**	**6.0000e-005**	**0.0000**	**2.4893**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1157	0.0000	0.1157	0.0592	0.0000	0.0592	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0140	0.2860	0.3444	5.7000e-004		0.0142	0.0142		0.0142	0.0142	0.0000	50.1633	50.1633	0.0162	0.0000	50.5689
Total	**0.0140**	**0.2860**	**0.3444**	**5.7000e-004**	**0.1157**	**0.0142**	**0.1299**	**0.0592**	**0.0142**	**0.0734**	**0.0000**	**50.1633**	**50.1633**	**0.0162**	**0.0000**	**50.5689**

3.2 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0600e-003	7.5000e-004	8.6900e-003	3.0000e-005	1.7800e-003	2.0000e-005	1.8000e-003	5.0000e-004	2.0000e-005	5.2000e-004	0.0000	2.4878	2.4878	6.0000e-005	0.0000	2.4893
Total	**1.0600e-003**	**7.5000e-004**	**8.6900e-003**	**3.0000e-005**	**1.7800e-003**	**2.0000e-005**	**1.8000e-003**	**5.0000e-004**	**2.0000e-005**	**5.2000e-004**	**0.0000**	**2.4878**	**2.4878**	**6.0000e-005**	**0.0000**	**2.4893**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2516	0.0000	0.2516	0.1269	0.0000	0.1269	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1521	1.5731	1.1076	2.3300e-003		0.0739	0.0739		0.0680	0.0680	0.0000	204.5101	204.5101	0.0661	0.0000	206.1637
Total	**0.1521**	**1.5731**	**1.1076**	**2.3300e-003**	**0.2516**	**0.0739**	**0.3255**	**0.1269**	**0.0680**	**0.1949**	**0.0000**	**204.5101**	**204.5101**	**0.0661**	**0.0000**	**206.1637**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	8.4000e-004	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2582	0.2582	2.0000e-005	0.0000	0.2587
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9400e-003	2.0900e-003	0.0241	8.0000e-005	8.2300e-003	6.0000e-005	8.2900e-003	2.1900e-003	6.0000e-005	2.2400e-003	0.0000	6.9105	6.9105	1.7000e-004	0.0000	6.9148
Total	**2.9600e-003**	**2.9300e-003**	**0.0243**	**8.0000e-005**	**8.2900e-003**	**6.0000e-005**	**8.3500e-003**	**2.2100e-003**	**6.0000e-005**	**2.2600e-003**	**0.0000**	**7.1687**	**7.1687**	**1.9000e-004**	**0.0000**	**7.1735**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0981	0.0000	0.0981	0.0495	0.0000	0.0495	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0571	1.1242	1.3771	2.3300e-003		0.0487	0.0487		0.0487	0.0487	0.0000	204.5099	204.5099	0.0661	0.0000	206.1634
Total	**0.0571**	**1.1242**	**1.3771**	**2.3300e-003**	**0.0981**	**0.0487**	**0.1469**	**0.0495**	**0.0487**	**0.0982**	**0.0000**	**204.5099**	**204.5099**	**0.0661**	**0.0000**	**206.1634**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	8.4000e-004	1.9000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.2582	0.2582	2.0000e-005	0.0000	0.2587
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9400e-003	2.0900e-003	0.0241	8.0000e-005	4.9500e-003	6.0000e-005	5.0100e-003	1.3800e-003	6.0000e-005	1.4400e-003	0.0000	6.9105	6.9105	1.7000e-004	0.0000	6.9148
Total	**2.9600e-003**	**2.9300e-003**	**0.0243**	**8.0000e-005**	**4.9900e-003**	**6.0000e-005**	**5.0500e-003**	**1.3900e-003**	**6.0000e-005**	**1.4500e-003**	**0.0000**	**7.1687**	**7.1687**	**1.9000e-004**	**0.0000**	**7.1735**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1699	1.6435	1.9439	3.1200e-003		0.0859	0.0859		0.0815	0.0815	0.0000	271.0731	271.0731	0.0549	0.0000	272.4461
Total	**0.1699**	**1.6435**	**1.9439**	**3.1200e-003**		**0.0859**	**0.0859**		**0.0815**	**0.0815**	**0.0000**	**271.0731**	**271.0731**	**0.0549**	**0.0000**	**272.4461**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9600e-003	0.0674	0.0167	1.8000e-004	4.6300e-003	1.2000e-004	4.7600e-003	1.3400e-003	1.2000e-004	1.4600e-003	0.0000	17.7868	17.7868	1.0900e-003	0.0000	17.8141
Worker	9.7300e-003	6.9100e-003	0.0800	2.5000e-004	0.0273	2.0000e-004	0.0275	7.2400e-003	1.8000e-004	7.4200e-003	0.0000	22.8967	22.8967	5.8000e-004	0.0000	22.9111
Total	**0.0117**	**0.0743**	**0.0966**	**4.3000e-004**	**0.0319**	**3.2000e-004**	**0.0322**	**8.5800e-003**	**3.0000e-004**	**8.8800e-003**	**0.0000**	**40.6835**	**40.6835**	**1.6700e-003**	**0.0000**	**40.7252**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1699	1.6435	1.9439	3.1200e-003		0.0859	0.0859		0.0815	0.0815	0.0000	271.0727	271.0727	0.0549	0.0000	272.4458
Total	**0.1699**	**1.6435**	**1.9439**	**3.1200e-003**		**0.0859**	**0.0859**		**0.0815**	**0.0815**	**0.0000**	**271.0727**	**271.0727**	**0.0549**	**0.0000**	**272.4458**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9600e-003	0.0674	0.0167	1.8000e-004	3.1200e-003	1.2000e-004	3.2500e-003	9.7000e-004	1.2000e-004	1.0800e-003	0.0000	17.7868	17.7868	1.0900e-003	0.0000	17.8141
Worker	9.7300e-003	6.9100e-003	0.0800	2.5000e-004	0.0164	2.0000e-004	0.0166	4.5700e-003	1.8000e-004	4.7500e-003	0.0000	22.8967	22.8967	5.8000e-004	0.0000	22.9111
Total	**0.0117**	**0.0743**	**0.0966**	**4.3000e-004**	**0.0195**	**3.2000e-004**	**0.0198**	**5.5400e-003**	**3.0000e-004**	**5.8300e-003**	**0.0000**	**40.6835**	**40.6835**	**1.6700e-003**	**0.0000**	**40.7252**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2910	2.8107	3.5956	5.7900e-003		0.1372	0.1372		0.1302	0.1302	0.0000	503.6198	503.6198	0.1013	0.0000	506.1519
Total	**0.2910**	**2.8107**	**3.5956**	**5.7900e-003**		**0.1372**	**0.1372**		**0.1302**	**0.1302**	**0.0000**	**503.6198**	**503.6198**	**0.1013**	**0.0000**	**506.1519**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7200e-003	0.0942	0.0277	3.3000e-004	8.6000e-003	1.1000e-004	8.7100e-003	2.4800e-003	1.0000e-004	2.5900e-003	0.0000	32.0369	32.0369	1.7600e-003	0.0000	32.0810
Worker	0.0170	0.0116	0.1369	4.5000e-004	0.0506	3.6000e-004	0.0510	0.0135	3.3000e-004	0.0138	0.0000	40.9366	40.9366	9.6000e-004	0.0000	40.9607
Total	**0.0197**	**0.1059**	**0.1646**	**7.8000e-004**	**0.0592**	**4.7000e-004**	**0.0597**	**0.0159**	**4.3000e-004**	**0.0164**	**0.0000**	**72.9735**	**72.9735**	**2.7200e-003**	**0.0000**	**73.0417**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2910	2.8107	3.5956	5.7900e-003		0.1372	0.1372		0.1302	0.1302	0.0000	503.6192	503.6192	0.1013	0.0000	506.1513
Total	**0.2910**	**2.8107**	**3.5956**	**5.7900e-003**		**0.1372**	**0.1372**		**0.1302**	**0.1302**	**0.0000**	**503.6192**	**503.6192**	**0.1013**	**0.0000**	**506.1513**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7200e-003	0.0942	0.0277	3.3000e-004	5.8000e-003	1.1000e-004	5.9100e-003	1.7900e-003	1.0000e-004	1.9000e-003	0.0000	32.0369	32.0369	1.7600e-003	0.0000	32.0810
Worker	0.0170	0.0116	0.1369	4.5000e-004	0.0304	3.6000e-004	0.0308	8.4900e-003	3.3000e-004	8.8200e-003	0.0000	40.9366	40.9366	9.6000e-004	0.0000	40.9607
Total	**0.0197**	**0.1059**	**0.1646**	**7.8000e-004**	**0.0362**	**4.7000e-004**	**0.0367**	**0.0103**	**4.3000e-004**	**0.0107**	**0.0000**	**72.9735**	**72.9735**	**2.7200e-003**	**0.0000**	**73.0417**

3.5 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1094					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0115	0.0782	0.1087	1.8000e-004		4.2500e-003	4.2500e-003		4.2500e-003	4.2500e-003	0.0000	15.3195	15.3195	9.2000e-004	0.0000	15.3424
Total	**1.1209**	**0.0782**	**0.1087**	**1.8000e-004**		**4.2500e-003**	**4.2500e-003**		**4.2500e-003**	**4.2500e-003**	**0.0000**	**15.3195**	**15.3195**	**9.2000e-004**	**0.0000**	**15.3424**

3.5 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.0600e-003	0.0125	4.0000e-005	4.6100e-003	3.0000e-005	4.6400e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.7255	3.7255	9.0000e-005	0.0000	3.7277
Total	**1.5500e-003**	**1.0600e-003**	**0.0125**	**4.0000e-005**	**4.6100e-003**	**3.0000e-005**	**4.6400e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.7255**	**3.7255**	**9.0000e-005**	**0.0000**	**3.7277**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1094					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0115	0.0782	0.1087	1.8000e-004		4.2500e-003	4.2500e-003		4.2500e-003	4.2500e-003	0.0000	15.3195	15.3195	9.2000e-004	0.0000	15.3424
Total	**1.1209**	**0.0782**	**0.1087**	**1.8000e-004**		**4.2500e-003**	**4.2500e-003**		**4.2500e-003**	**4.2500e-003**	**0.0000**	**15.3195**	**15.3195**	**9.2000e-004**	**0.0000**	**15.3424**

3.5 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.0600e-003	0.0125	4.0000e-005	2.7700e-003	3.0000e-005	2.8000e-003	7.7000e-004	3.0000e-005	8.0000e-004	0.0000	3.7255	3.7255	9.0000e-005	0.0000	3.7277
Total	**1.5500e-003**	**1.0600e-003**	**0.0125**	**4.0000e-005**	**2.7700e-003**	**3.0000e-005**	**2.8000e-003**	**7.7000e-004**	**3.0000e-005**	**8.0000e-004**	**0.0000**	**3.7255**	**3.7255**	**9.0000e-005**	**0.0000**	**3.7277**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0284	0.2803	0.4011	6.3000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	55.0739	55.0739	0.0178	0.0000	55.5192
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0284**	**0.2803**	**0.4011**	**6.3000e-004**		**0.0140**	**0.0140**		**0.0129**	**0.0129**	**0.0000**	**55.0739**	**55.0739**	**0.0178**	**0.0000**	**55.5192**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.0400e-003	0.0122	4.0000e-005	4.5300e-003	3.0000e-005	4.5600e-003	1.2000e-003	3.0000e-005	1.2300e-003	0.0000	3.6590	3.6590	9.0000e-005	0.0000	3.6612
Total	**1.5200e-003**	**1.0400e-003**	**0.0122**	**4.0000e-005**	**4.5300e-003**	**3.0000e-005**	**4.5600e-003**	**1.2000e-003**	**3.0000e-005**	**1.2300e-003**	**0.0000**	**3.6590**	**3.6590**	**9.0000e-005**	**0.0000**	**3.6612**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0284	0.2803	0.4011	6.3000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	55.0738	55.0738	0.0178	0.0000	55.5191
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0284**	**0.2803**	**0.4011**	**6.3000e-004**		**0.0140**	**0.0140**		**0.0129**	**0.0129**	**0.0000**	**55.0738**	**55.0738**	**0.0178**	**0.0000**	**55.5191**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5200e-003	1.0400e-003	0.0122	4.0000e-005	2.7200e-003	3.0000e-005	2.7500e-003	7.6000e-004	3.0000e-005	7.9000e-004	0.0000	3.6590	3.6590	9.0000e-005	0.0000	3.6612
Total	**1.5200e-003**	**1.0400e-003**	**0.0122**	**4.0000e-005**	**2.7200e-003**	**3.0000e-005**	**2.7500e-003**	**7.6000e-004**	**3.0000e-005**	**7.9000e-004**	**0.0000**	**3.6590**	**3.6590**	**9.0000e-005**	**0.0000**	**3.6612**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7244	2.0756	6.9603	0.0236	2.3839	0.0190	2.4029	0.6369	0.0178	0.6547	0.0000	2,212.5112	2,212.5112	0.0670	0.0000	2,214.1858
Unmitigated	0.7244	2.0756	6.9603	0.0236	2.3839	0.0190	2.4029	0.6369	0.0178	0.6547	0.0000	2,212.5112	2,212.5112	0.0670	0.0000	2,214.1858

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	1,859.68	1,936.51	1682.38	6,305,763	6,305,763
Total	1,859.68	1,936.51	1,682.38	6,305,763	6,305,763

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.553184	0.042828	0.203573	0.117591	0.015120	0.005857	0.021819	0.035126	0.000000	0.000000	0.004903	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	341.1004	341.1004	0.0138	3.2900e-003	342.4255
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	341.1004	341.1004	0.0138	3.2900e-003	342.4255
NaturalGas Mitigated	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	184.7716	184.7716	3.5400e-003	3.3900e-003	185.8696
NaturalGas Unmitigated	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	184.7716	184.7716	3.5400e-003	3.3900e-003	185.8696

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.46249e+006	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	184.7716	184.7716	3.5400e-003	3.3900e-003	185.8696
Total		**0.0187**	**0.1596**	**0.0679**	**1.0200e-003**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0.0000**	**184.7716**	**184.7716**	**3.5400e-003**	**3.3900e-003**	**185.8696**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.46249e+006	0.0187	0.1596	0.0679	1.0200e-003		0.0129	0.0129		0.0129	0.0129	0.0000	184.7716	184.7716	3.5400e-003	3.3900e-003	185.8696
Total		**0.0187**	**0.1596**	**0.0679**	**1.0200e-003**		**0.0129**	**0.0129**		**0.0129**	**0.0129**	**0.0000**	**184.7716**	**184.7716**	**3.5400e-003**	**3.3900e-003**	**185.8696**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.4498e+006	341.1004	0.0138	3.2900e-003	342.4255
Total		**341.1004**	**0.0138**	**3.2900e-003**	**342.4255**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.4498e+006	341.1004	0.0138	3.2900e-003	342.4255
Total		**341.1004**	**0.0138**	**3.2900e-003**	**342.4255**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.4583	0.0643	2.0494	3.7000e-004		0.0146	0.0146		0.0146	0.0146	0.0000	50.6256	50.6256	4.1000e-003	8.7000e-004	50.9865
Unmitigated	1.4583	0.0643	2.0494	3.7000e-004		0.0146	0.0146		0.0146	0.0146	0.0000	50.6256	50.6256	4.1000e-003	8.7000e-004	50.9865

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.7800e-003	0.0409	0.0174	2.6000e-004		3.3000e-003	3.3000e-003		3.3000e-003	3.3000e-003	0.0000	47.3070	47.3070	9.1000e-004	8.7000e-004	47.5881
Landscaping	0.0612	0.0234	2.0321	1.1000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	3.3186	3.3186	3.1900e-003	0.0000	3.3984
Total	**1.4583**	**0.0643**	**2.0494**	**3.7000e-004**		**0.0146**	**0.0146**		**0.0146**	**0.0146**	**0.0000**	**50.6256**	**50.6256**	**4.1000e-003**	**8.7000e-004**	**50.9865**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1109					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.7800e-003	0.0409	0.0174	2.6000e-004		3.3000e-003	3.3000e-003		3.3000e-003	3.3000e-003	0.0000	47.3070	47.3070	9.1000e-004	8.7000e-004	47.5881
Landscaping	0.0612	0.0234	2.0321	1.1000e-004		0.0113	0.0113		0.0113	0.0113	0.0000	3.3186	3.3186	3.1900e-003	0.0000	3.3984
Total	**1.4583**	**0.0643**	**2.0494**	**3.7000e-004**		**0.0146**	**0.0146**		**0.0146**	**0.0146**	**0.0000**	**50.6256**	**50.6256**	**4.1000e-003**	**8.7000e-004**	**50.9865**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	51.6355	0.3366	8.3700e-003	62.5426
Unmitigated	51.6355	0.3366	8.3700e-003	62.5426

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	10.2683 / 6.47348	51.6355	0.3366	8.3700e-003	62.5426
Total		**51.6355**	**0.3366**	**8.3700e-003**	**62.5426**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	10.2683 / 6.47348	51.6355	0.3366	8.3700e-003	62.5426
Total		**51.6355**	**0.3366**	**8.3700e-003**	**62.5426**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	46.8564	2.7691	0.0000	116.0848
Unmitigated	46.8564	2.7691	0.0000	116.0848

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	230.83	46.8564	2.7691	0.0000	116.0848
Total		**46.8564**	**2.7691**	**0.0000**	**116.0848**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	230.83	46.8564	2.7691	0.0000	116.0848
Total		**46.8564**	**2.7691**	**0.0000**	**116.0848**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX 3.2:
EMFAC2017 EMISSION RATES

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EMFAC2017 Derived CalEEMod Annual Emission Rates: Year 2023[1,2]

Season	Pollutant	LDA	LDT1	LDT2	MDV	LHDT1	LHDT2	MHDT	HHDT	OBUS	UBUS	MCY	SBUS	MH
Annual	CH4_IDLEX	0	0	0	0	0.0045407	0.00276992	0.002755155	0.022399945	0.008522	0	0	0.0872051	0
Annual	CH4_RUNEX	0.0018869	0.0057489	0.0031844	0.0041642	0.0044198	0.003263925	0.00087349	0.027816115	0.0054045	3.0424882	0.3131324	0.0066033	0.0032743
Annual	CH4_STREX	0.0448692	0.0733726	0.0629169	0.0781102	0.0134844	0.007177894	0.007030234	2.14182E-07	0.0240057	0.0246221	0.2420258	0.008099	0
Annual	CO_IDLEX	0	0	0	0	0.1678772	0.126758625	0.328949805	6.433638207	0.4864641	0	0	3.4287623	0
Annual	CO_RUNEX	0.560021	1.2218976	0.7892313	0.9170107	0.5983104	0.443005373	0.121131478	0.238528941	0.7023385	23.596827	18.854788	0.5536067	0.3331045
Annual	CO_STREX	2.0291591	2.2798463	2.5854594	2.9900286	0.8884942	0.47818962	0.809250221	0.004385463	2.6752142	1.8623285	8.642447	1.078573	0
Annual	CO2_NBIO_IDLEX	0	0	0	0	9.3581592	14.92008755	67.2854915	1065.923835	64.367009	0	0	369.73833	0
Annual	CO2_NBIO_RUNEX	251.70403	298.86564	314.21685	396.16171	619.96277	614.9225059	911.0199741	1272.829483	1335.493	1635.6231	207.59836	1096.5469	929.32761
Annual	CO2_NBIO_STREX	52.262945	63.705824	67.25728	84.063345	9.9909554	6.424441145	7.214801684	0.03594404	21.276475	22.961833	60.360049	6.9242759	0
Annual	NOX_IDLEX	0	0	0	0	0.0826802	0.121917702	0.397207898	5.312422425	0.2257829	0	0	3.3195995	0
Annual	NOX_RUNEX	0.0309022	0.1047964	0.0645781	0.0871858	1.3894798	1.517354389	0.908191511	1.955483692	0.905988	0.3035805	1.125469	4.420865	4.2679083
Annual	NOX_STREX[3]	0.1657278	0.2618108	0.2551235	0.3291257	0.2837258	0.159545375	1.799471753	2.495253007	0.6856266	0.2242227	0.2630249	0.7800028	0
Annual	PM10_IDLEX	0	0	0	0	0.0010129	0.001512805	0.000433919	0.002365147	7.511E-05	0	0	0.0033043	0
Annual	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060417566	0.13034	0.0918981	0.01176	0.7448002	0.13034
Annual	PM10_PMTW	0.008	0.008	0.008	0.008	0.0100668	0.010946027	0.012000003	0.035225137	0.012	0.0202294	0.004	0.0105986	0.016
Annual	PM10_RUNEX	0.0013047	0.0018934	0.0013477	0.0014102	0.0102968	0.013566467	0.009466862	0.024179126	0.0084683	0.0021823	0.0017969	0.0257095	0.1361859
Annual	PM10_STREX	0.0017588	0.0025559	0.0017952	0.0018512	0.0002106	9.84354E-05	8.28075E-05	4.71852E-07	0.0002181	0.0002239	0.0027747	4.794E-05	0
Annual	PM25_IDLEX	0	0	0	0	0.0009691	0.001447362	0.000415148	0.002262832	7.186E-05	0	0	0.0031614	0
Annual	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.025893242	0.05586	0.0393849	0.00504	0.3192001	0.05586
Annual	PM25_PMTW	0.002	0.002	0.002	0.002	0.0025167	0.002736507	0.003000001	0.008806284	0.003	0.0050573	0.001	0.0026497	0.004
Annual	PM25_RUNEX	0.0012018	0.0017423	0.0012406	0.0013009	0.0098328	0.012970752	0.009054989	0.023133139	0.0080878	0.0020674	0.0016796	0.0245874	0.1302946
Annual	PM25_STREX	0.0016172	0.0023502	0.0016506	0.0017022	0.0001937	9.05077E-05	7.61385E-05	4.33851E-07	0.0002005	0.0002059	0.0026088	4.408E-05	0
Annual	ROG_DIURN	0.0499353	0.1617031	0.0834193	0.1040066	0.0023924	0.001119316	0.00041816	2.61104E-06	0.0026672	0.0028048	1.4319645	0.0015764	0
Annual	ROG_HTSK	0.0863623	0.224901	0.1201124	0.1521245	0.0693882	0.033771174	0.014777615	9.67852E-05	0.0265187	0.0159707	0.7872755	0.0114418	0
Annual	ROG_IDLEX	0	0	0	0	0.0196433	0.014878453	0.015150214	0.435555976	0.0456612	0	0	0.4072026	0
Annual	ROG_RESTL	0.0401253	0.1141391	0.0708635	0.09308	0.0012616	0.000613159	0.000227643	1.60287E-06	0.0011772	0.0011467	0.7584722	0.0007923	0
Annual	ROG_RUNEX	0.0069514	0.0249376	0.0126	0.0170823	0.0538669	0.055274928	0.009544935	0.018413033	0.0303843	0.0485813	2.1137636	0.0924064	0.070494
Annual	ROG_RUNLS	0.1934756	0.7345866	0.3938448	0.4562317	0.4372965	0.194951955	0.073961783	0.000443814	0.2925608	0.0762512	1.766858	0.0695237	0
Annual	ROG_STREX	0.1913074	0.3650898	0.2841172	0.3772633	0.0668598	0.035024058	0.037511191	1.09632E-06	0.1278709	0.0951018	1.8332332	0.0473665	0
Annual	SO2_IDLEX	0	0	0	0	9.037E-05	0.000142292	0.00063797	0.010008431	0.0006149	0	0	0.0035362	0
Annual	SO2_RUNEX	0.0024592	0.0029207	0.0030702	0.0038688	0.0060263	0.005916347	0.00865572	0.011844363	0.0129659	0.0063195	0.0020544	0.0104989	0.0087855
Annual	SO2_STREX	0.0005107	0.0006226	0.0006573	0.0008215	9.887E-05	6.35751E-05	7.13963E-05	3.55695E-07	0.0002105	0.0002272	0.0005973	6.852E-05	0
Annual	TOG_DIURN	0.0499652	0.1618001	0.0834693	0.104069	0.0023924	0.001119316	0.00041816	2.61104E-06	0.0026672	0.0028048	1.4319645	0.0015764	0
Annual	TOG_HTSK	0.086414	0.225036	0.1201844	0.1522157	0.0693882	0.033771174	0.014777615	9.67852E-05	0.0265187	0.0159707	0.7872755	0.0114418	0
Annual	TOG_IDLEX	0	0	0	0	0.0273519	0.019755884	0.020335748	0.498029629	0.0615992	0	0	0.5877605	0
Annual	TOG_RESTL	0.0401494	0.1142076	0.070906	0.0931359	0.0012616	0.000613159	0.000227643	1.60287E-06	0.0011772	0.0011467	0.7584722	0.0007923	0
Annual	TOG_RUNEX	0.0101114	0.0363937	0.0183641	0.0248389	0.0650001	0.064111366	0.011716585	0.048106314	0.042616	3.1108101	2.6116906	0.1099741	0.0802528
Annual	TOG_RUNLS	0.1935917	0.7350273	0.3940811	0.4565054	0.4372965	0.194951955	0.073961783	0.000443814	0.2925608	0.0762512	1.766858	0.0695237	0
Annual	TOG_STREX	0.2096036	0.4000067	0.31129	0.4133425	0.0732031	0.038346935	0.041070033	1.20033E-06	0.1400025	0.1041245	1.995157	0.0518603	0
Summer	CH4_IDLEX	0	0	0	0	0.0045537	0.002777346	0.002627006	0.023685478	0.0085919	0	0	0.087323	0
Summer	CH4_RUNEX	0.0021288	0.0064142	0.0035754	0.00468	0.0044899	0.003286251	0.00088813	0.027816513	0.0055394	3.0425325	0.3087008	0.0066875	0.0032743
Summer	CH4_STREX	0.0389698	0.0632511	0.0545439	0.0676753	0.0129677	0.00690337	0.006757077	2.04342E-07	0.0229107	0.0223864	0.2137359	0.0067519	0
Summer	CO_IDLEX	0	0	0	0	0.1678772	0.126758625	0.286623132	6.346404591	0.4831512	0	0	3.3921972	0
Summer	CO_RUNEX	0.6718832	1.444288	0.9408609	1.0908713	0.6064749	0.44537467	0.122787353	0.238667787	0.7182675	23.599015	18.832855	0.5628972	0.3331045
Summer	CO_STREX	1.7035307	1.9077361	2.1628263	2.4949482	0.8424303	0.453635343	0.76370611	0.004138722	2.4874475	1.5837573	7.9028329	0.7742141	0
Summer	CO2_NBIO_IDLEX	0	0	0	0	9.3581592	14.92008755	67.23807783	1052.827751	63.701705	0	0	378.97922	0
Summer	CO2_NBIO_RUNEX	272.11086	320.05904	334.37657	417.65631	619.97723	614.9266661	911.022875	1272.829712	1335.521	1635.6271	207.41131	1096.5634	929.32761
Summer	CO2_NBIO_STREX	51.649898	62.92991	66.443304	83.08804	9.9086217	6.380643186	7.137174571	0.035552778	20.958077	22.490884	58.436811	6.4152164	0
Summer	NOX_IDLEX	0	0	0	0	0.0826802	0.121917702	0.389589606	5.06332578	0.2145979	0	0	3.3986484	0
Summer	NOX_RUNEX	0.0280097	0.0940928	0.0582614	0.0787008	1.3091179	1.433264131	0.855681654	1.848376656	0.8404265	0.2953035	0.9735285	4.1579413	4.0281165
Summer	NOX_STREX[3]	0.1544099	0.2438047	0.2376668	0.3065529	0.2725695	0.153283811	1.796581904	2.495247894	0.67484	0.2132216	0.2477416	0.7742504	0
Summer	PM10_IDLEX	0	0	0	0	0.0010129	0.001512805	0.000368743	0.002078293	6.674E-05	0	0	0.0027928	0
Summer	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060417566	0.13034	0.0918981	0.01176	0.7448002	0.13034
Summer	PM10_PMTW	0.008	0.008	0.008	0.008	0.0100668	0.010946027	0.012000003	0.035225137	0.012	0.0202294	0.004	0.0105986	0.016
Summer	PM10_RUNEX	0.0013047	0.0018934	0.0013477	0.0014102	0.0102968	0.013566467	0.009466862	0.024179126	0.0084683	0.0021823	0.0017969	0.0257095	0.1361859
Summer	PM10_STREX	0.0017588	0.0025559	0.0017952	0.0018512	0.0002106	9.84354E-05	8.28075E-05	4.71852E-07	0.0002181	0.0002239	0.0027747	4.794E-05	0
Summer	PM25_IDLEX	0	0	0	0	0.0009691	0.001447362	0.000352791	0.001988387	6.385E-05	0	0	0.0026719	0
Summer	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.025893242	0.05586	0.0393849	0.00504	0.3192001	0.05586
Summer	PM25_PMTW	0.002	0.002	0.002	0.002	0.0025167	0.002736507	0.003000001	0.008806284	0.003	0.0050573	0.001	0.0026497	0.004
Summer	PM25_RUNEX	0.0012018	0.0017423	0.0012406	0.0013009	0.0098328	0.012970752	0.009054989	0.023133139	0.0080878	0.0020674	0.0016796	0.0245874	0.1302946
Summer	PM25_STREX	0.0016172	0.0023502	0.0016506	0.0017022	0.0001937	9.05077E-05	7.61385E-05	4.33851E-07	0.0002005	0.0002059	0.0026088	4.408E-05	0
Summer	ROG_DIURN	0.092411	0.3004602	0.1538291	0.1910835	0.0042442	0.001991577	0.000750934	4.90319E-06	0.0046974	0.0049809	2.749938	0.0027601	0
Summer	ROG_HTSK	0.0964851	0.2626975	0.1350376	0.1681545	0.0783689	0.038223824	0.016691363	0.000106277	0.02873	0.0185244	1.093855	0.0118519	0
Summer	ROG_IDLEX	0	0	0	0	0.0196433	0.014878453	0.014777375	0.461157561	0.046602	0	0	0.4069309	0
Summer	ROG_RESTL	0.074744	0.2153647	0.1301545	0.1692383	0.0024046	0.001167999	0.000445854	3.30486E-06	0.0022654	0.0022658	1.7203704	0.0014667	0
Summer	ROG_RUNEX	0.0077545	0.027671	0.0140193	0.0190131	0.0542184	0.055368784	0.009608999	0.018415253	0.0310306	0.0487059	2.0708739	0.0928205	0.070494
Summer	ROG_RUNLS	0.19018	0.7222288	0.3867896	0.4487595	0.4382743	0.195546185	0.074182136	0.000449203	0.292559	0.0739941	1.737429	0.0635263	0
Summer	ROG_STREX	0.1642963	0.3120517	0.243675	0.3234745	0.0640835	0.033570914	0.035891613	1.04898E-06	0.121682	0.0863448	1.6073261	0.0394336	0
Summer	SO2_IDLEX	0	0	0	0	9.037E-05	0.000142292	0.000637618	0.009885111	0.0006086	0	0	0.0036235	0
Summer	SO2_RUNEX	0.0026586	0.0031278	0.0032672	0.0040789	0.0060265	0.005916388	0.008655749	0.011844366	0.0129662	0.0063196	0.0020525	0.0104991	0.0087855
Summer	SO2_STREX	0.0005048	0.000615	0.0006493	0.000812	9.805E-05	6.31416E-05	7.06281E-05	3.51824E-07	0.0002074	0.0002226	0.0005783	6.348E-05	0
Summer	TOG_DIURN	0.0924663	0.3006404	0.1539213	0.1911981	0.0042442	0.001991577	0.000750934	4.90319E-06	0.0046974	0.0049809	2.749938	0.0027601	0
Summer	TOG_HTSK	0.0965429	0.2628551	0.1351186	0.1682553	0.0783689	0.038223824	0.016691363	0.000106277	0.02873	0.0185244	1.093855	0.0118519	0
Summer	TOG_IDLEX	0	0	0	0	0.0273519	0.019755884	0.019726007	0.527271847	0.0626703	0	0	0.5874511	0
Summer	TOG_RESTL	0.0747888	0.2154939	0.1302326	0.1693398	0.0024046	0.001167999	0.000445854	3.30486E-06	0.0022654	0.0022658	1.7203704	0.0014667	0
Summer	TOG_RUNEX	0.0112836	0.0403843	0.0204362	0.0276549	0.065513	0.064248322	0.011810066	0.048109554	0.0435591	3.1109919	2.5604951	0.1105783	0.0802528
Summer	TOG_RUNLS	0.1902941	0.7226621	0.3870217	0.4490288	0.4382743	0.195546185	0.074182136	0.000449203	0.292559	0.0739941	1.737429	0.0635263	0
Summer	TOG_STREX	0.1800093	0.3418961	0.26698	0.3544098	0.0701634	0.036755925	0.039296798	1.14851E-06	0.1332265	0.0945367	1.7493542	0.0431748	0

Winter	CH4_IDLEX	0	0	0	0	0.004543	0.002771192	0.002945617	0.018584837	0.0084633	0	0	0.0872067	0
Winter	CH4_RUNEX	0.0018546	0.0056563	0.0031317	0.0040923	0.0044277	0.003266732	0.000874173	0.000819608	0.0054162	3.0424922	0.3105787	0.006602	0.0032743
Winter	CH4_STREX	0.0448619	0.0733484	0.06291	0.0781049	0.0133912	0.007129132	0.006964358	2.12516E-07	0.0239298	0.0244988	0.2370663	0.0082436	0
Winter	CO_IDLEX	0	0	0	0	0.1678772	0.126758625	0.388116692	6.514513971	0.4910392	0	0	3.4792571	0
Winter	CO_RUNEX	0.539678	1.180697	0.7614855	0.884759	0.5991695	0.443274557	0.121271705	0.153089453	0.703653	23.59702	18.300696	0.5534118	0.3331045
Winter	CO_STREX	2.0132412	2.2625156	2.5675453	2.9698032	0.8802741	0.47392663	0.800617995	0.004338734	2.6656906	1.8457548	8.4278924	1.1017425	0
Winter	CO2_NBIO_IDLEX	0	0	0	0	9.3581592	14.92008755	67.34688641	1077.398907	65.285763	0	0	356.97711	0
Winter	CO2_NBIO_RUNEX	248.26101	295.28652	310.81441	392.53295	619.96429	614.9229798	911.0202216	1253.680895	1335.4953	1635.6235	206.64372	1096.5466	929.32761
Winter	CO2_NBIO_STREX	52.236878	63.676368	67.227734	84.02981	9.9762095	6.416799952	7.200173203	0.035869944	21.259945	22.933868	59.88215	6.9638689	0
Winter	NOX_IDLEX	0	0	0	0	0.0826802	0.121917702	0.40772782	5.618352499	0.2412289	0	0	3.2104368	0
Winter	NOX_RUNEX	0.029509	0.100183	0.0616871	0.0832989	1.3670637	1.49381553	0.892924017	1.918074232	0.8881268	0.3014555	1.0889414	4.3545929	4.1977547
Winter	NOX_STREX[3]	0.164118	0.2593714	0.2526727	0.3259915	0.2794792	0.157150746	1.798611157	2.495251484	0.6823205	0.2222737	0.2604454	0.7802853	0
Winter	PM10_IDLEX	0	0	0	0	0.0010129	0.001512805	0.000523924	0.002699758	8.667E-05	0	0	0.0040108	0
Winter	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060043994	0.13034	0.0918981	0.01176	0.7448002	0.13034
Winter	PM10_PMTW	0.008	0.008	0.008	0.008	0.0100668	0.010946027	0.012000003	0.035007311	0.012	0.0202294	0.004	0.0105986	0.016
Winter	PM10_RUNEX	0.0013047	0.0018934	0.0013477	0.0014102	0.0102968	0.013566467	0.009466862	0.024151342	0.0084683	0.0021823	0.0017969	0.0257095	0.1361859
Winter	PM10_STREX	0.0017588	0.0025559	0.0017952	0.0018512	0.0002106	9.84354E-05	8.28075E-05	4.71852E-07	0.0002181	0.0002239	0.0027747	4.794E-05	0
Winter	PM25_IDLEX	0	0	0	0	0.0009691	0.001447362	0.000501259	0.002582967	8.292E-05	0	0	0.0038373	0
Winter	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.02573314	0.05586	0.0393849	0.00504	0.3192001	0.05586
Winter	PM25_PMTW	0.002	0.002	0.002	0.002	0.0025167	0.002736507	0.003000001	0.008751828	0.003	0.0050573	0.001	0.0026497	0.004
Winter	PM25_RUNEX	0.0012018	0.0017423	0.0012406	0.0013009	0.0098328	0.012970752	0.009054989	0.023106557	0.0080878	0.0020674	0.0016796	0.0245874	0.1302946
Winter	PM25_STREX	0.0016172	0.0023502	0.0016506	0.0017022	0.0001937	9.05077E-05	7.61385E-05	4.33851E-07	0.0002005	0.0002059	0.0026088	4.408E-05	0
Winter	ROG_DIURN	0.0488148	0.1633364	0.0798345	0.0974958	0.0024967	0.001135244	0.000435792	2.68249E-06	0.0027829	0.0028434	1.6393559	0.0014837	0
Winter	ROG_HTSK	0.0944738	0.2576047	0.1320133	0.1644796	0.0804822	0.03841713	0.016334791	0.000107927	0.028432	0.0178481	1.0540129	0.0117059	0
Winter	ROG_IDLEX	0	0	0	0	0.0196433	0.014878453	0.015676089	0.400126443	0.0443619	0	0	0.4075779	0
Winter	ROG_RESTL	0.0401785	0.1138154	0.071025	0.0934274	0.0013209	0.000634648	0.000238868	1.72859E-06	0.0012515	0.0012014	0.7628485	0.0008183	0
Winter	ROG_RUNEX	0.0068278	0.0245071	0.0123808	0.0167676	0.0539028	0.055285876	0.009550806	0.017311118	0.0304402	0.0485932	2.0925849	0.0924026	0.070494
Winter	ROG_RUNLS	0.2190298	0.8575349	0.4555568	0.5238872	0.4706234	0.210639325	0.08059738	0.000472322	0.3114386	0.0890146	2.0230662	0.0843655	0
Winter	ROG_STREX	0.1911347	0.3645853	0.2838611	0.376922	0.0663485	0.034760684	0.037229432	1.08808E-06	0.1274435	0.0945968	1.7917479	0.0482208	0
Winter	SO2_IDLEX	0	0	0	0	9.037E-05	0.000142292	0.000638416	0.010178731	0.0006236	0	0	0.0034157	0
Winter	SO2_RUNEX	0.0024256	0.0028857	0.0030369	0.0038333	0.0060263	0.005916352	0.008655723	0.011844363	0.0129659	0.0063195	0.0020449	0.0104989	0.0087855
Winter	SO2_STREX	0.0005105	0.0006223	0.000657	0.0008212	9.872E-05	6.34994E-05	7.12516E-05	3.54962E-07	0.0002104	0.0002269	0.0005926	6.891E-05	0
Winter	TOG_DIURN	0.0488441	0.1634344	0.0798823	0.0975543	0.0024967	0.001135244	0.000435792	2.68249E-06	0.0027829	0.0028434	1.6393559	0.0014837	0
Winter	TOG_HTSK	0.0945304	0.2577593	0.1320924	0.1645782	0.0804822	0.03841713	0.016334791	0.000107927	0.028432	0.0178481	1.0540129	0.0117059	0
Winter	TOG_IDLEX	0	0	0	0	0.0273519	0.019755884	0.021193826	0.455513497	0.0601201	0	0	0.5881877	0
Winter	TOG_RESTL	0.0402026	0.1138837	0.0710676	0.0934835	0.0013209	0.000634648	0.000238868	1.72859E-06	0.0012515	0.0012014	0.7628485	0.0008183	0
Winter	TOG_RUNEX	0.0099311	0.0357655	0.0180442	0.0243809	0.0650526	0.064127342	0.011725152	0.019738418	0.0426976	3.1108276	2.5860036	0.1099684	0.0802528
Winter	TOG_RUNLS	0.2191612	0.8580494	0.4558302	0.5242015	0.4706234	0.210639325	0.08059738	0.000472322	0.3114386	0.0890146	2.0230662	0.0843655	0
Winter	TOG_STREX	0.2094144	0.3994539	0.3110094	0.4129687	0.0726433	0.038058574	0.040761542	1.19131E-06	0.1395346	0.1035715	1.9500346	0.0527957	0

1 Source: California Air Resources Board. EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/; California Air Pollution Control Officers Association (CAPCOA). 2017, November. California Emissions Estimator Model User's Guide, Version 2016.3.2, Appendix A.

2 Unless otherwise noted, per CalEEMod methodology, the calculated CalEEMod emission rates are derived from the emission rates obtained using the EMFAC2017 Web Database for the Los Angeles (SC) region .

3 Because EMFAC2017 provides vehicle trips data for MHDT and HHDT diesel trucks, the formula provided in Appendix A of the CalEEMod User's Guide in calculating the NO_x STREX emission rates are utilized.

APPENDIX 3.3:
EV CHARGING STATIONS CALCULATIONS

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GHG Emissions Reduction from Electric Vehicle Charging Stations

Parameters		Unit
Estimating GHG Emissions Reductions from Replacement of Gasoline Vheicles with Electric Vehicles		
SCE Electricity Emission Factor[1]	0.24	MT CO_2e/MWH
Fuel Economy of Electric Vehicle[2]	0.25	kWh/mi
Gasoline/Diesel CO_2e Emission while Running[3]	265	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]	**5**	charging stations
Annual VMT Reduction from All Stations (Based on Charge)	141,120	mi/yr
Estimated Benefit from Installing On-Site Electric Vehicle Chargin Stations		
GHG Emissions of Gasoline/Diesel Vehicle[7]	37.44	$MTCO_2e$/yr
GHG Emissions of Electric Vehicle[8]	8.33	
Annual GHG Emissions Reductions	**29**	**$MTCO_2e$/yr**

[1] CO_2e weighted intensity factor for SCE accounts for CO_2 and CH_4 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 CO_2, CH_4, and N_2O were estimated using EMFAC2017 for light-duty gasoline and diesel-powered vehicles, aggregated for all models and speeds, averaged over all seasons in calendar year 2024. Emission rate was converted to CO_2e 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 CO_2e emission rate.

[8] GHG emissions calculated using annual VMT reduction at all stations , fuel economy of electric vehicles, along with SCE electricity CO_2e emission factor.

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