

HARMONY GROVE VILLAGE SOUTH

APPENDIX J

GREENHOUSE GAS ANALYSES REPORT

to the

DRAFT ENVIRONMENTAL IMPACT REPORT

PDS2015-GPA-15-002; PDS2015-SP-15-002
PDS2015-TM-5600; PDS2015-REZ-15-003
PDS2015-MUP-15-008; PDS2015-ER-15-08-006

APRIL 2017

Prepared for:
COUNTY OF SAN DIEGO
PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310
SAN DIEGO, CALIFORNIA 92123

Harmony Grove Village South Project

Greenhouse Gas Analyses Report

PDS2015-GPA-15-002; PDS2015-SP-15-002

PDS2015-TM-5600; PDS2015-REZ-15-003

PDS2015-MUP-15-008; PDS2015-ER-15-08-006

April 2017

Project Proponent:

RCS Harmony Partners, LLC

2305 Historic Decatur Road, Suite 100
San Diego, CA 92106

Prepared for:

County of San Diego

Planning & Development Services

5510 Overland Avenue, Suite 310
San Diego, CA 92123



Joanne M. Dramko, AICP

County-approved Air Quality Consultant

Prepared by:

HELIX Environmental Planning, Inc.

7578 El Cajon Boulevard
La Mesa, CA 91942

Harmony Grove Village South Project

Greenhouse Gas Analyses Report

PDS2015-GPA-15-002; PDS2015-SP-15-002
PDS2015-TM-5600; PDS2015-REZ-15-003
PDS2015-MUP-15-008; PDS2015-ER-15-08-006

Prepared for:
County of San Diego
Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Project Proponent:
RCS Harmony Partners, LLC
2305 Historic Decatur Road, Suite 100
San Diego, CA 92106

Prepared by:
Joanne M. Dramko, AICP
County-approved Air Quality Consultant
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

April 2017

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION AND PROJECT DESCRIPTION.....	1
1.1 Understanding Global Climate Change	1
1.2 Greenhouse Gases of Primary Concern	1
1.2.1 Types of GHGs	2
1.3 Project Location and Description.....	4
1.4 Regulatory Requirements and Project Design Features that Reduce GHG Emissions	5
1.4.1 Regulatory Requirements.....	5
1.4.2 Project Design Features	6
2.0 ENVIRONMENTAL SETTING	7
2.1 Worldwide GHG Inventory	7
2.2 State and Regional GHG Inventories.....	7
2.3 On-site GHG Inventory.....	9
2.4 Consequences of Global Climate Change	9
3.0 REGULATORY SETTING.....	10
3.1 Federal Greenhouse Gas Regulations	10
3.1.1 Federal Clean Air Act	10
3.1.2 Corporate Average Fuel Economy Standards	10
3.2 California Greenhouse Gas Regulations	11
3.2.1 California Code of Regulations, Title 24, Part 6	11
3.2.2 California Code of Regulations, Title 24, Part 11, California Green Building Standards Code	11
3.2.3 Executive Order S-3-05	12
3.2.4 Assembly Bill 32 – Global Warming Solutions Act of 2006	12
3.2.5 Executive Order B-30-15	12
3.2.6 Senate Bill 32.....	12
3.2.7 Assembly Bill 197.....	12
3.2.8 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases	13
3.2.9 Assembly Bill 75.....	13
3.2.10 Assembly Bill 341.....	13
3.2.11 Executive Order S-01-07	13
3.2.12 Senate Bill 97 – CEQA: Greenhouse Gas Emissions	14
3.2.13 Senate Bill 375.....	14
3.3 California Greenhouse Gas Programs and Plans	14
3.3.1 California Air Resources Board: Scoping Plan	14

TABLE OF CONTENTS (cont.)

<u>Section</u>	<u>Page</u>
3.4 Local Policies and Plans: County of San Diego	15
3.4.1 County of San Diego General Plan	15
3.4.2 San Diego County Green Building Incentive Program.....	15
3.4.3 County of San Diego Construction and Demolition Recycling Ordinance	15
3.4.4 San Diego Association of Governments: San Diego Forward: The Regional Plan.....	16
4.0 GUIDELINES FOR DETERMINING SIGNIFICANCE	16
5.0 IMPACT ANALYSIS.....	21
5.1 Methodology and Assumptions	21
5.1.1 Vehicle Emission Assumptions	21
5.1.2 Building Use Assumptions	22
5.1.3 WTWRP Assumptions.....	22
5.1.4 Construction Assumptions.....	22
5.2 Construction Emissions	25
5.3 Project Emissions.....	26
5.3.1 Vehicle Emissions.....	26
5.3.2 Area Source Emissions	26
5.3.3 Energy Emissions.....	27
5.3.4 Water Use and Wastewater Treatment Emissions	27
5.3.5 Solid Waste Emissions.....	28
5.3.6 Emissions Associated with Off-road Equipment.....	28
5.3.7 Summary	28
5.4 Significance of Impacts.....	29
6.0 PROJECT CONSISTENCY WITH ADOPTED PLANS, POLICIES, AND REGULATIONS	30
6.1 State Plans	30
6.2 Local Plans.....	30
7.0 RESIDUAL IMPACTS AND CONCLUSIONS.....	31
8.0 HORIZON YEAR (2030 AND 2050) ANALYSIS	32
8.1 Post-2020 Targets	32
8.2 State’s Goal to Install 12,000 MW of Renewable Distributed Generation Systems by 2020	34
8.3 Non-interference with Construction of Net-Zero Energy Homes After 2020	34
8.4 Non-interference with AB 758’s Existing Buildings Energy Efficiency Action Plan	34
8.5 Other State Programs – Cap-and-Trade.....	34
9.0 REFERENCES	36
10.0 LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED.....	40

TABLE OF CONTENTS (cont.)

APPENDICES

A	CalEEMod and Roadway Model Output Data
B	Emission Reduction Adjustments
C	Average Trip Length Analysis
D	Efficiency Metric Calculations

LIST OF FIGURES

<u>No.</u>	<u>Title</u>	<u>Follows Page</u>
1	Regional Location Map.....	4
2	Project Vicinity Map.....	4

LIST OF TABLES

<u>No.</u>	<u>Title</u>	<u>Page</u>
1	Global Warming Potential and Atmospheric Lifetimes.....	2
2	California GHG Emissions by Sector in 1990, 2000, 2004, and 2008	8
3	San Diego County GHG Emissions by Sector in 2006	8
4	2020 Efficiency Metric	20
5	Project Component Assumptions.....	21
6	Construction Equipment Assumptions	23
7	Modeled Construction Schedule	25
8	Estimated Construction Emissions	26
9	Estimated Operational Emissions with Project Design Features and State and Federal Mandates	28
10	GHG Emissions Significance Determination	29
11	County General Plan Policies	31

LIST OF TERMS AND ACRONYMS

AB	Assembly Bill
ADT	average daily trip
AEP	Association of Environmental Professionals
APN	Assessor's Parcel Number
BAU	business-as-usual
BMP	best management practice
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CALGreen	California Green Building
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAS	California Climate Adaptation Strategy
CAT	Climate Action Team
CBSC	California Building Standards Commission
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CEUS	California Commercial End Use Survey
CF	chlorofluoride
CFC	chlorofluorocarbon
CGB	California Green Builder
CH ₄	methane
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
County	County of San Diego
EO	Executive Order
EPIC	Energy Policy Initiative Center
F	Fahrenheit
GHG	greenhouse gas
gpd	gallons per day
GWP	global warming potential
HFC	hydrofluorocarbon
HVAC	heating, ventilation, and air conditioning

LIST OF TERMS AND ACRONYMS (cont.)

I-	Interstate
IPCC	Intergovernmental Panel on Climate Change
kBTU	kiloBritish Thermal Units
kWh	kilowatt-hours
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LLG	Linscott, Law & Greenspan Engineers
MMT	million metric tons
Montreal Protocol	Montreal Protocol on Substances That Deplete the Ozone Layer
mpg	miles per gallon
mph	miles per hour
MPO	Metropolitan Planning Organization
MT	metric ton
N ₂ O	nitrous oxide
NHTSA	National Highway Traffic Safety Administration
NO ₂	nitrogen dioxide
NO _x	oxides of nitrogen
OAL	Office of Administrative Law
ODC	ozone-depleting substance
OPR	Office of Planning and Research
PDS	Planning & Development Services
PFC	perfluorocarbon
ppm	parts per million
PV	photovoltaic
RASS	Residential Appliance Saturation Survey
RPS	Renewable Portfolios Standard
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SDG&E	San Diego Gas and Electric
SF ₆	hexafluoride
SP	service population
SR	State Route

LIST OF TERMS AND ACRONYMS (cont.)

TIA	Traffic Impact Analysis
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
U.S.	United States
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VOC	volatile organic compound
WTWRF	wastewater treatment and water reclamation facility

EXECUTIVE SUMMARY

This report evaluates the potential greenhouse gas (GHG) emission impacts associated with the Harmony Grove Village (HGV) South Project (“Project” or “Proposed Project”). An assessment was made to estimate the total GHG emissions that would be emitted as a result of construction and operation of the Proposed Project. Construction sources of GHG emissions include heavy construction equipment, worker vehicle miles traveled (VMT), and water use. Operational sources of GHG emissions sources include energy, area sources, water use, transportation, and solid waste.

Project buildout is anticipated to be in 2021; therefore, it would be required to comply with the 2016 Title 24 Energy Code; the 2016 CALGreen Building Code; the Assembly Bill (AB) 341 target for 75 percent diversion of operational waste; reduction of potable water use by 20 percent; low-flow water and bathroom fixtures; reduction of wastewater generation by 20 percent; weather-based irrigation systems; provide areas for storage and collection of recyclables and yard waste; roof anchors and pre-wiring to allow for the installation of photovoltaic (PV) systems; and preparation of a Construction and Demolition Debris Management Plan in compliance with Sections 68.508 through 68.518 of the County of San Diego Municipal Code that requires 90 percent of inerts and 70 percent of all other materials to be recycled.

In addition to the regulatory requirements listed above, the Project would incorporate several design features and best management practices (BMPs) to reduce construction and operational GHG emissions. The energy features would also be verified in the Title 24 Compliance Report submitted during the building permit process. These features include:

- Energy-efficient three-coat stucco exteriors;
- High-efficiency window glazing;
- Energy Star™ or equivalent appliances and energy-efficient lighting;
- Renewable energy would supply 100 percent of the Project’s electricity needs, by requiring the installation of rooftop solar PV panels (a photovoltaic system) on all residential units, the Center House and WTWRF located within the Project site. As an alternative to the installation of PV panels on a particular building unit, enrollment in a renewables program similar to SDG&E’s SunRate may be substituted if the program can be verified to supply 100 percent of the electricity needs from renewable sources for that building unit for the life of that unit. The applicant must provide the County of San Diego (County) with documentation that the program meets the requirements stated herein by supplying the building unit with its electricity needs from renewable sources over the lifetime of the building. With each building permit, the estimated number of units requiring the installation of solar panel will be provided to the County of San Diego to determine the overall remaining number of units needed to comply with this measure;
- Drought-tolerant landscaping plan;

- High efficiency drip irrigation systems;
- The use of reclaimed water for outdoor irrigation;
- Natural gas fireplaces in residences;
- Electrical outlets on the exterior walls of residences to promote the use of electric landscape maintenance equipment;
- Noticing for homebuyers of incentive and rebate programs available through San Diego Gas & Electric (SDG&E) or other providers that encourage the purchase of electric landscape maintenance equipment;
- An electric car re-charging station in the parking area for the Center House;
- Programmable thermostat timers; and
- High efficiency water heaters.

The Project-related construction activities are estimated to generate approximately 3,682 metric tons (MT) of carbon dioxide equivalent (CO₂e). Construction emissions are amortized over 20 years, such that the proposed construction activities would contribute an average of 184 MT per year of CO₂e emissions. The Project-related operational and amortized construction GHG emissions are estimated to generate approximately 5,272 MT CO₂e per year.

The impact significance determination is based upon an efficiency metric based on compliance with the California's target of reducing 2020 GHG emissions to 1990 levels, consistent with AB 32. The efficiency target for 2020 is 4.9 MT CO₂e per service population (SP) per year. The efficiency metric, adjusted for anticipated Project buildout in 2021, is 4.6 MT CO₂e/SP/year, in keeping with the 2030 emissions reduction goal of Executive Order (EO) B-30-15, codified by Senate Bill (SB) 32. The Project would result in emissions totaling 4.4 MT CO₂e/SP/year. As such, the Project would be consistent with AB 32, and is on the State's reduction trajectory at buildout for meeting the SB 32 and EO S-3-05's reduction targets. GHG emission impacts would be less than significant.

1.0 INTRODUCTION AND PROJECT DESCRIPTION

This report evaluates the significance of the Proposed Project's contribution of greenhouse gas (GHG) emissions to statewide GHG emissions and GHG emissions reduction targets. To evaluate the incremental effect of Project development on statewide and global climate change, it is important to have a basic understanding of the nature of the global climate change problem.

1.1 Understanding Global Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. The earth's climate is in a state of constant flux with periodic warming and cooling cycles. Extreme periods of cooling are termed "ice ages," which may then be followed by extended periods of warmth. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated, interacting natural factors that include: volcanic eruptions which spew gases and particles (dust) into the atmosphere; the amount of water, vegetation, and ice covering the earth's surface; subtle changes in the earth's orbit; and the amount of energy released by the sun (sun cycles). However, since the beginning of the Industrial Revolution around 1750, the average temperature of the earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone.

With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, natural gas, and biomass. Industrial processes have also created emissions of substances that are not found in nature. This in turn has led to a marked increase in the emissions of gases that have been shown to influence the world's climate. These gases, termed "greenhouse" gases, influence the amount of heat that is trapped in the earth's atmosphere. Because recently observed increased concentrations of GHGs in the atmosphere are related to increased emissions resulting from human activity, the current cycle of "global warming" is generally believed to be largely due to human activity. Of late, the issue of global warming or global climate change has arguably become the most important and widely debated environmental issue in the United States and the world. Because climate change is caused by the collective of human actions taking place throughout the world, it is quintessentially a global or cumulative issue.

1.2 Greenhouse Gases of Primary Concern

Global climate change refers to changes in Earth's temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs, such as HFC-23), perfluorocarbons (PFCs; such as CF₄), and sulfur hexafluoride (SF₆), which are known as GHGs. The potential of a gas to trap heat and warm the atmosphere is measured by its global warming potential (GWP). GHGs either break down or are absorbed over time. Thus, the potential of a gas to contribute to global warming is limited by the time it is in the atmosphere, or its "atmospheric lifetime." To account for these effects, GWPs are calculated over a 100-year time horizon (U.S. Environmental Protection Agency [USEPA] 2010a). Because of its relative abundance in the atmosphere and its relatively long atmospheric lifetime, carbon

dioxide has been designated the reference gas for comparing GWPs. Thus, the 100-year GWP of CO₂ is equal to one (see Table 1, *Global Warming Potential and Atmospheric Lifetimes*).

Table 1 GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIMES		
Gas	Atmospheric Lifetime (Years)	100-year GWP^a
Carbon Dioxide (CO ₂)	50-200	1
Methane (CH ₄) ^b	9-15	21
Nitrous oxide (N ₂ O)	120	310
HFC-23	264	11,700
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
CF ₄	50,000	6,500
C ₂ F ₆	10,000	9,200
C ₄ F ₁₀	2,600	7,000
C ₆ F ₁₄	3,200	7,400
SF ₆	3,200	23,900

Source: USEPA 2010a.

^a Global warming potentials (GWPs) used here are calculated over 100-year time horizon.

^b The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO₂ is not included.

1.2.1 Types of GHGS

Water vapor is the most abundant and variable GHG in the atmosphere. It is not considered a pollutant; it maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves (Association of Environmental Professionals; [AEP] 2007).

CO₂ is an odorless, colorless GHG. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human-caused) sources of CO₂ include the burning of fuels such as coal, oil, natural gas, and wood. Concentrations are currently around 379 parts per million (ppm); some scientists say that concentrations may increase to 1,130 CO₂ equivalent (CO₂e) ppm by 2100 as a direct result of anthropogenic sources (Intergovernmental Panel on Climate Change; [IPCC] 2007). Some predict that this will result in an average global temperature rise of at least 7.2 degrees Fahrenheit (°F) (IPCC 2007). The GWP of CO₂ is defined as one; the GWP of other GHGs is expressed as multiples of the GWP of CO₂.

CH₄ is a gas and is the main component of natural gas used in homes. It has a GWP of about 21, or 21 times the GWP of CO₂. A natural source of CH₄ is from the decay of organic matter. Geological deposits known as natural gas fields contain CH₄, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

N₂O, also known as laughing gas, is a colorless gas and has a GWP of about 310. N₂O is produced by microbial processes in soil and water, including reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (e.g., nylon and nitric acid production) also emit N₂O. It is used in rocket engines, as an aerosol spray propellant, and in racecars. During combustion, NO_x (NO_x is a generic term for mono-nitrogen oxides, NO and NO₂) is produced as a criteria pollutant and is not the same as N₂O. Very small quantities of N₂O may be formed during fuel combustion by nitrogen and oxygen (American Petroleum Institute [API] 2004).

Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in CH₄ or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at earth's surface). Chlorofluorocarbons were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped by requirements of the Montreal Protocol (as described in Section 1.1.1). Fluorocarbons have a GWP of between 140 and 11,700, with the lower end being for HFC-152a and the higher end being for HFC-23.

SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It has the highest GWP of any gas (23,900). SF₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Ozone is a GHG, although unlike the other GHGs, it is relatively short-lived in the troposphere and, therefore, is not global in nature. According to the California Air Resources Board (CARB), it is difficult to make an accurate determination of the contribution of ozone precursors (NO_x and volatile organic compounds [VOCs]) to global warming (CARB 2006).

A summary of the most common naturally occurring and artificial GHGs is provided in Table 1.

Of the gases listed in Table 1, CO₂, CH₄ and N₂O, are produced by both natural and anthropogenic (human) sources. The remaining gases HFCs, chlorofluorides (CFs), and SF₆, are the result of solely human processes.

The increase in the earth's temperature is expected to have wide-ranging effects on the environment. Although global climate change is anticipated to affect all areas of the globe, there are numerous implications of direct importance to California. Statewide average temperatures are anticipated to increase by between 3 and 10.5°F by 2100. Some climate models indicate that this warming may be greater in the summer than in the winter. This could result in widespread adverse impacts to ecosystem health, agricultural production, water use and supply, and energy demand. Increased temperatures could reduce the Sierra Nevada snowpack and put additional

strain on the state's water supply. In addition, increased temperatures would be conducive to the formation of air pollutants, resulting in poor air quality.

It is also important to note that even if GHG emissions were to be eliminated or dramatically reduced, it is projected that the effect of those emissions would continue to affect global climate for centuries.

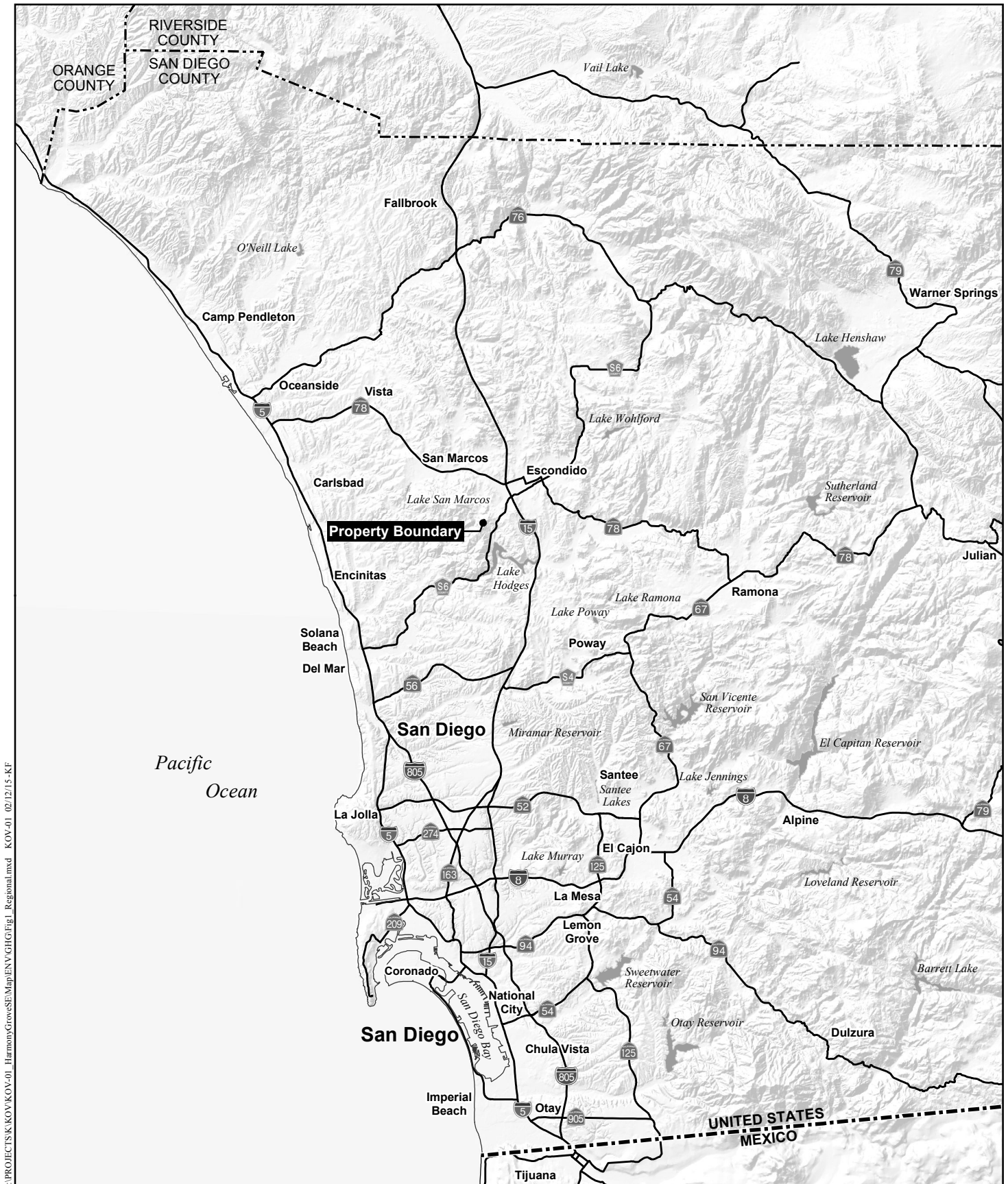
1.3 Project Location and Description

The Project includes an approximately 111-acre site in an unincorporated portion of San Diego County (County) in the community of Harmony Grove (see Figure 1, *Regional Location Map*). The Project contains parcels with the following Assessor's Parcel Numbers (APNs): 235-011-06-00, 238-021-08-00, 238-021-09-00, and 238-021-10-00. The Project site is located approximately 2.5 miles west of Interstate (I-) 15 and approximately 2.6 miles south of State Route (SR) 78. Escondido Creek flows east-west just north of the Project, and the City of Escondido is located to the east. The community of Elfin Forest is located to the west. County open-space parcels (the Del Dios Highland Preserve) abut the southern boundary of the Project. The western Project boundary abuts Country Club Drive. Primary access to the Project vicinity is provided by Harmony Grove Road and Country Club Drive (see Figure 2, *Project Vicinity Map*).

The Proposed Project would contain 453 residential units and a small community center with limited retail/commercial uses (the Center House). The total square footage of structures associated with the Center House use would be approximately 5,000 square feet, with a minimum of 1,500 square feet of commercial use. The residential units would be a mix of multi- and single-family units. The Project design includes an on-site wastewater treatment and water reclamation facility (WTWRF) located in the northwestern portion of the site.¹ This facility would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000 gallons per day (gpd) Harmony Grove plant design that serves 1,951 residents, a scaled-down version could be constructed to serve the Proposed Project.

Two Project entries would be provided from Country Club Drive south of the Escondido Creek Crossing. The first would be located approximately one-quarter mile south of the intersection with Harmony Grove Road and would provide direct access to Project's retail/commercial uses. A second entrance would be located approximately 200 feet north of Cordrey Drive and would provide direct access to the Projects' residential uses.

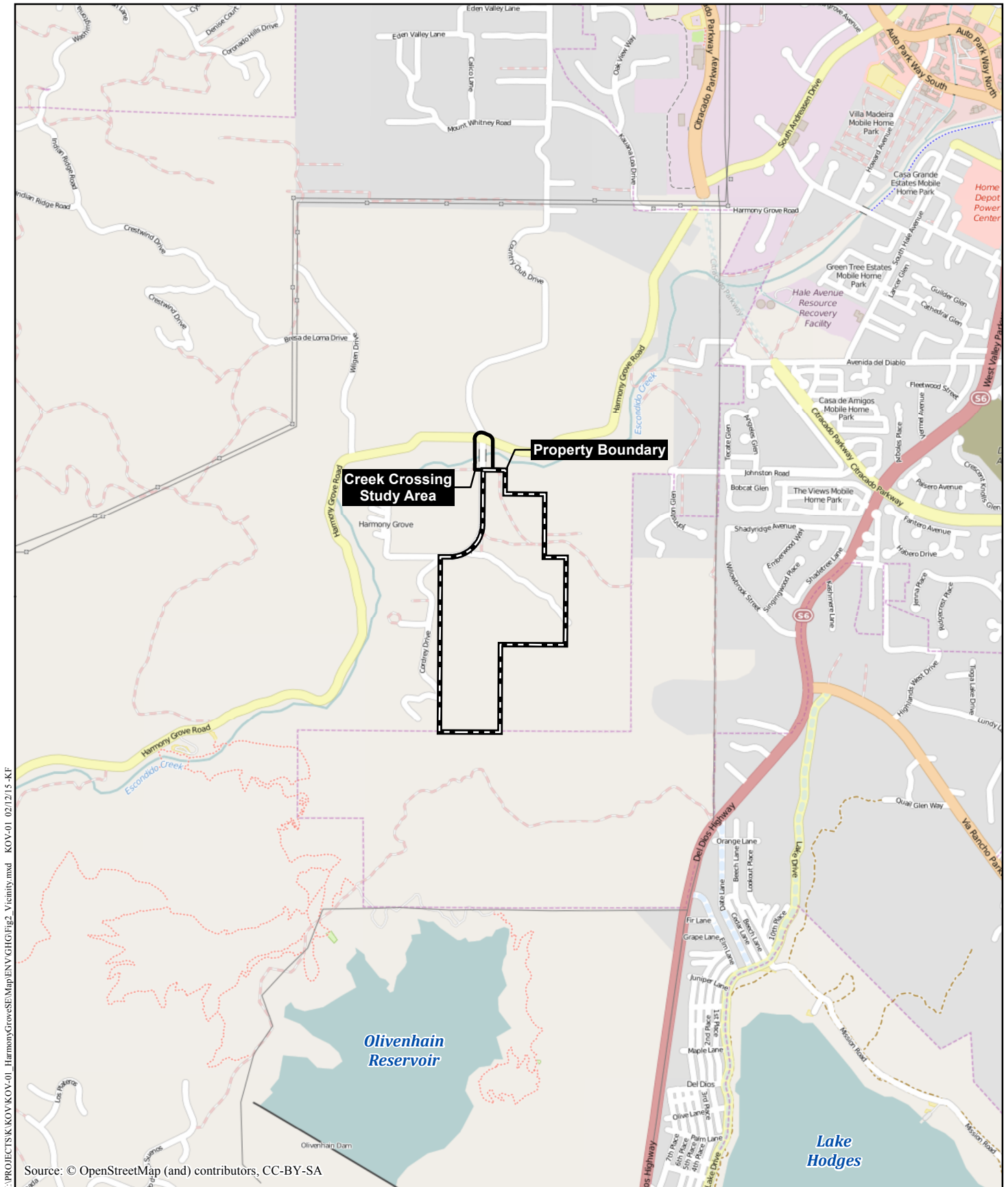
¹ As described in the Project EIR Chapter 4.0, Alternatives, alternative design scenarios were evaluated for the treatment of wastewater. Of the possible scenarios, the full on-site WTWRF proposed for the Project would result in the greatest emissions, and was therefore included in this analysis as a worst case.



Regional Location Map

HARMONY GROVE VILLAGE SOUTH

Figure 1



Project Vicinity Map

HARMONY GROVE VILLAGE SOUTH

Figure 2

1.4 Regulatory Requirements and Project Design Features that Reduce GHG Emissions

1.4.1 Regulatory Requirements

Energy Efficiencies

The Project will be designed to meet current Title 24 energy efficiency standards. In accordance with the requirements of 2016 Title 24, the Project will:

- Install enhanced ceiling, attic, and wall insulation,
- Install high efficiency window glazing,
- Install whole house fans,
- Have the installation of all heating, ventilation, and air conditioning (HVAC) units verified by a third party, and
- Include roof anchors and pre-wiring to allow for the installation of photovoltaic (PV) systems.

Water Conservation

In accordance with 2016 CALGreen mandatory measures, the Project will:

- Reduce potable water use by 20 percent,
- Install low-flow water fixtures,
- Reduce wastewater generation by 20 percent,
- Install low-flow bathroom fixtures, and
- Install weather-based smart irrigation control systems.

Solid Waste Reduction

- A Construction and Demolition Debris Management Plan will be developed to divert debris from construction and demolition away from landfills. In accordance with County Ordinance Sections 68.508 through 68.518, 90 percent of inerts and 70 percent of all other materials from the Project will be recycled.
- In accordance with 2016 CALGreen criteria, at least 50 percent of construction waste would be diverted from landfills through reuse and recycling.
- Provide areas for storage and collection of recyclables and yard waste in accordance with 2016 CALGreen for operational waste.

1.4.2 Project Design Features

The Project proposes sustainability and efficiency features which would reduce the operational GHG emissions associated with the Proposed Project. These design features have been incorporated into the Project and include Specific Plan policies and performance measures, Project conditions, as well as building permit conditions that will be verified prior to the issuance of final certificate of occupancy. These include, but are not limited to, the following:

Area Source Reductions

Only natural gas fireplaces are to be installed in residences.

Energy Efficiency

The Project would include several features that would improve energy efficiency to comply with 2016 Title 24 energy efficiency requirements, including:

- Renewable energy would supply 100 percent of the Project's electricity needs by requiring the installation of rooftop solar PV panels (a photovoltaic system) on all residential units, the Center House and WTWRF located within the Project site. As an alternative to the installation of PV panels on a particular building unit, enrollment in a renewables program similar to SDG&E's SunRate may be substituted if the program can be verified to supply 100 percent of the electricity needs from renewable sources for that building unit for the life of that unit. The applicant must provide the County with documentation that the program meets the requirements stated herein by supplying the building unit with its electricity needs from renewable sources over the lifetime of the building. With each building permit, the estimated number of units requiring the installation of solar panel will be provided to the County to determine the overall remaining number of units needed to comply with this measure;
- Installation of electrical outlets on the exterior walls of residences to promote the use of electric landscape maintenance equipment.
- Notices will be provided to homebuyers of incentive and rebate programs available through San Diego Gas & Electric (SDG&E) or other providers that encourage the purchase of electric landscape maintenance equipment.
- Provision of an electric car re-charging station in the parking area for the Center House.
- Installation of programmable thermostat timers.
- Installation of energy efficient appliances (Energy Star™ or equivalent).
- Installation of high efficiency water heaters.
- Use of energy-efficient three-coat stucco exteriors.

These energy features would undergo independent third-party inspection and diagnostics as part of the California Green Builder (CGB) verification and commissioning process. The energy features would also be verified in the Title 24 Compliance Report submitted during the building permit process.

Water Conservation

- Outdoor landscaping plan that minimizes turf and maximizes drought-tolerant plants.
- Incorporation of weather-based irrigation controllers, multi-programmable irrigation clocks, and high efficiency drip irrigation systems.
- Utilize reclaimed water for outdoor irrigation.

2.0 ENVIRONMENTAL SETTING

2.1 Worldwide GHG Inventory

The United Nations IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC concluded that a stabilization of GHGs at 400 to 450 ppm CO₂e concentration is required to keep global mean warming below 3.6°F, which is assumed to be necessary to avoid dangerous climate change (AEP 2007).

In the year 2012, total GHG emissions worldwide were estimated at 44,816 million metric tons (MMT) CO₂e (World Resources Institute 2017). The United States contributed the second largest portion of GHG emissions (behind China) at 14 percent of global emissions. Total GHG emissions from the United States were 6,673 MMT CO₂e in 2013 (USEPA 2015). On a national level, approximately 27 percent of GHG emissions were associated with transportation and about 31 percent were associated with electricity generation.

2.2 State and Regional GHG Inventories

CARB performs statewide GHG inventories. The inventory is divided into six broad sectors; agriculture and forestry, commercial, electricity generation, industrial, residential, and transportation. Emissions are quantified in MMT of CO₂e. Table 2, *California Greenhouse Gas Emissions by Sector*, shows the estimated statewide GHG emissions for the years 1990, 2000, 2010, and 2013.

Table 2
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR
(MMT CO₂e)

Sector	1990	2000	2010	2013
Agriculture and Forestry	23.6 (5%)	32.1 (7%)	34.5 (8%)	36.2 (8%)
Commercial	14.4 (3%)	15.0 (3%)	21.6 (5%)	22.6 (5%)
Electricity Generation	110.6 (26%)	105.2 (22%)	90.5 (20%)	90.6 (20%)
Industrial	103.0 (24%)	105.4 (22%)	102.7 (23%)	104.2 (23%)
Residential	29.7 (7%)	31.8 (7%)	32.2 (7%)	32.3 (7%)
Transportation	150.7 (35%)	178.1 (38%)	173.7 (38%)	172.5 (38%)
Unspecified Remaining	1.3 (<1%)	1.2 (<1%)	0.8 (<1%)	0.8 (<1%)
TOTAL	433.3	468.8	456.0	459.3

Source: CARB 2007 and CARB 2015b

As shown in Table 2, statewide GHG source emissions totaled 433 MMT CO₂e in 1990, 469 MMT CO₂e in 2000, 456 MMT CO₂e in 2010, and 459 MMT CO₂e in 2013. According to data from the CARB, it appears that statewide GHG emissions peaked in 2004, and are now beginning to decrease (CARB 2010a). Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions.

A San Diego regional emissions inventory was prepared by the University of San Diego School of Law, Energy Policy Initiative Center (EPIC) that took into account the unique characteristics of the region. Their 2010 emissions inventory for San Diego is duplicated below in Table 3, *San Diego County GHG Emissions by Sector in 2010*. The sectors included in this inventory are somewhat different from those in the statewide inventory.

Table 3
SAN DIEGO COUNTY GREENHOUSE GAS EMISSIONS
BY SECTOR IN 2010 (MMT CO₂e)

Sector	2010
On-road Transportation	14.4 (43%)
Electricity	8.3 (25%)
Natural Gas Consumption	2.9 (9%)
Off-Road Equipment and Vehicles	1.4 (4%)
Civil Aviation	1.9 (6%)
Waste	0.6 (2%)
Industrial	1.8 (5%)
Water-Borne Navigation	0.1 (<1%)
Rail	0.3 (1%)
Agriculture/Forestry/Land Use	0.5 (2%)
Other	1.6 (5%)
Sequestration	-0.7 (-2%)
TOTAL	33.2

Source: Energy Policy Initiatives Center 2013

According to the San Diego County GHG Inventory prepared by the EPIC in 2013, San Diego County emitted 33 MMT of CO₂e emissions in 2010. The largest contributor of GHGs in San Diego County was the on-road transportation category, which comprised 43 percent (14 MMT CO₂e) of the total amount. The second highest contributor was the electricity category, which contributed 8 MMT CO₂e, or 25 percent of the total. Together, the on-road transportation and electricity categories comprised 68 percent of the total GHG emissions for the County. The remaining amount was contributed by natural gas consumption, civil aviation, industrial processes, off-road equipment, waste, agriculture, rail, water-borne navigation, and other fuels. By 2020, regional GHG emissions are expected to be 43 MMT of CO₂e.

Similar to the statewide emissions, transportation-related GHG emissions contributed the most countywide, followed by emissions associated with energy use.

2.3 On-site GHG Inventory

The existing Project site is currently vacant. There are no current significant sources of on-site GHG emissions. Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants as they grow and then dispersed back into the environment when they die. Soil carbon accumulates from inputs of plants, roots, and other living components of the soil ecosystem (i.e., bacteria, worms, etc.). Soil carbon is lost through biological respiration, erosion, and other forms of disturbance. The existing GHG emissions are likely to be negligible.

2.4 Consequences of Global Climate Change

The anticipated consequences of global climate change have the potential to result in adverse impacts. Any increase in statewide average temperatures could result in widespread adverse impacts to ecosystem health, agricultural production, water use and supply, and energy demand. Increased temperatures could also reduce the Sierra Nevada snowpack and put additional strain on the region's water supply. In addition, increased temperatures would be conducive to the formation of air pollutants resulting in poor air quality.

To effectively address the challenges that a changing climate will bring, the State of California strengthened its commitment to climate adaptation and mitigation (i.e., reducing state GHG emissions) policies when Governor Arnold Schwarzenegger signed Executive Order (EO) S-13-08 on November 14, 2008. The order called on state agencies to develop California's first ever strategy to identify and prepare for these expected climate impacts. The California Natural Resources Agency (CNRA) has taken the lead in developing this adaptation strategy, working through the Climate Action Team (CAT). Seven sector-specific working groups led by 12 state agencies, boards and commissions, and numerous stakeholders were convened for this effort. Adaptation is a relatively new concept in California policy. The 2009 California Climate Adaptation Strategy (CAS) report summarizes the best-known science on climate change impacts in the state to assess vulnerability and outline possible solutions that can be implemented within and across state agencies to promote resiliency (CNRA 2009). This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts.

Future residents of the Proposed Project site could be exposed to increased risk of dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory disease. These risks, however, would be no different from those experienced by the San Diego region as a whole under the described scenario. Increased temperatures would result in more frequent use of air conditioning that would increase energy costs to residents, and could put a strain on the area's energy supplies. Because the Proposed Project is located inland well above sea level, no impacts related to sea level rise are anticipated.

3.0 REGULATORY SETTING

All levels of government have some responsibility for the protection of air quality, and each level (international, federal, state, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of air quality.

3.1 Federal Greenhouse Gas Regulations

3.3.1 Federal Clean Air Act

The U.S. Supreme Court ruled on April 2, 2007, in *Massachusetts v. U.S. Environmental Protection Agency*, that CO₂ is an air pollutant, as defined under the Clean Air Act (CAA), and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO₂, CH₄, N₂O, HFC, PFC, and SF₆) threaten the public health and welfare of the American people. This action was a prerequisite to finalizing the USEPA's GHG emissions standards for light-duty vehicles, which were jointly proposed by the USEPA and the United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA). The standards were established on April 1, 2010 for 2012 through 2016 model year vehicles and on October 15, 2012 for 2017 through 2025 model year vehicles (USEPA 2011; USEPA and NHTSA 2012).

3.1.2 Corporate Average Fuel Economy Standards

The USEPA and the NHTSA have been working together on developing a national program of regulations to reduce GHG emissions and to improve fuel economy of light-duty vehicles. The USEPA is finalizing the first-ever national GHG emissions standards under the CAA, and the NHTSA is finalizing Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. On April 1, 2010, the USEPA and NHTSA announced a joint Final Rulemaking that established standards for 2012 through 2016 model year vehicles. This was followed up on October 15, 2012, when the agencies issued a Final Rulemaking with standards for model years 2017 through 2025. The rules require these vehicles to meet an estimated combined average emissions level of 250 grams per mile by 2016, decreasing to an average industry fleet-wide level of 163 grams per mile in model year 2025. The 2016 standard is equivalent to 35.5 miles per gallon (mpg), and the 2025 standard is equivalent to 54.5 mpg if the levels were achieved solely through improvements in fuel efficiency. The agencies expect, however, that a portion of these improvements will be made through improvements in air conditioning leakage and the use of alternative refrigerants that would not contribute to fuel

economy. These standards would cut GHG emissions by an estimated 2 billion metric tons (MT) and 4 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2017–2025). The combined USEPA GHG standards and NHTSA CAFE standards resolve previously conflicting requirements under both federal programs and the standards of the State of California and other states that have adopted the California standards (USEPA 2011; USEPA and NHTSA 2012).

3.2 California Greenhouse Gas Regulations

3.2.1 California Code of Regulations, Title 24, Part 6

California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions.

The Title 24 standards are updated approximately every three years to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest update to the Title 24 standards occurred in 2016 and went into effect on January 1, 2017. The 2016 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The most significant efficiency improvements to the residential Standards include improvements for attics, walls, water heating, and lighting. The Standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards – the energy budgets – that vary by climate zone (of which there are 16 in California) and building type; thus the Standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

3.2.2 California Code of Regulations, Title 24, Part 11, California Green Building Standards Code

The California Green Building Standards Code (CALGreen Code; 24 CCR, Part 11) is a code with mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California. The code is Part 11 of the California Building Standards Code in Title 24 of the CCR (CBSC 2016). The current 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings went into effect on January 1, 2017.

The development of the CALGreen Code is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

The CALGreen Code contains requirements for storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

3.2.3 Executive Order S-3-05

On June 1, 2005, EO S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. In an effort to avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

3.2.4 Assembly Bill 32 – Global Warming Solutions Act of 2006

The California Global Warming Solutions Act of 2006, widely known as AB 32, requires that the CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

3.2.5 Executive Order B-30-15

On April 29, 2015, EO B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG reduction targets with those of leading international governments, including the 28-nation European Union. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in AB 32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050.

3.2.6 Senate Bill 32

As a follow up to AB 32 and in response to EO B-30-15, SB 32 was passed by the California legislature in August 2016 and signed by Governor Brown in September 2016 to codify the EO's California GHG reduction target of 40 percent below 1990 levels by 2030.

3.2.7 Assembly Bill 197

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to CARB and

the establishment a legislative committee to make recommendations about CARB programs to the legislature.

3.2.8 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases

AB 1493 (Pavley) requires that CARB develop and adopt regulations that achieve “the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State.” On September 24, 2009, CARB adopted amendments to the Pavley regulations that intend to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California’s enforcement of AB 1493 (starting in 2009), while providing vehicle manufacturers with new compliance flexibility. The amendments also prepare California to merge its rules with the federal CAFE rules for passenger vehicles (CARB 2013). In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single packet of standards called Advanced Clean Cars (CARB 2013).

3.2.9 Assembly Bill 75

AB 75 was passed in 1999 and mandates state agencies to develop and implement an integrated waste management plan to reduce GHG emissions related to solid waste disposal and diversion (recycling). In addition, the bill mandates that community service districts providing solid waste services report the disposal and diversion information to the appropriate city, county, or regional jurisdiction. Since 2004, the bill requires diversion of at least 50 percent of the solid waste from landfills and transformation facilities, and submission to the California Integrated Waste Management Board of an annual report describing the diversion rates.

3.2.10 Assembly Bill 341

The state legislature enacted AB 341 (California Public Resource Code Section 42649.2), increasing the diversion target to 75 percent statewide. AB 341 requires all businesses and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place. In addition, multi-family apartments with five or more units are also required to implement a recycling program. The final regulation was approved by the Office of Administrative Law (OAL) on May 7, 2012, and went into effect on July 1, 2012.

3.2.11 Executive Order S-01-07

This EO, signed by Governor Schwarzenegger on January 18, 2007, directs that a statewide goal be established to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by the year 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs the CARB to determine whether a LCFS can be adopted as a discrete early action measure pursuant to AB 32. CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in April 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

3.2.12 Senate Bill 97 – CEQA: Greenhouse Gas Emissions

SB 97 required the OPR to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009. The CEQA guidelines provide the lead agency with broad discretion in determining what methodology is used in assessing the impacts of GHG emissions in the context of a particular project. The OPR guidance also states that the lead agency can rely on qualitative or other performance based standards for estimating the significance of GHG emissions, although the CEQA Guidelines did not establish a threshold of significance.

3.2.13 Senate Bill 375

Senate Bill (SB) 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as “transit priority projects” would receive incentives to streamline CEQA processing.

3.3 California Greenhouse Gas Programs and Plans

3.3.1 California Air Resources Board: Scoping Plan

On December 11, 2008, the CARB adopted the Scoping Plan (CARB 2008b) as directed by AB 32. The Scoping Plan proposes a set of actions designed to reduce overall GHG emissions in California to the levels required by AB 32. Measures applicable to development projects include those related to energy-efficiency building and appliance standards, the use of renewable sources for electricity generation, regional transportation targets, and green building strategy. Relative to transportation, the Scoping Plan includes nine measures or recommended actions related to reducing vehicle miles traveled and vehicle GHGs through fuel and efficiency measures. These measures would be implemented statewide rather than on a project-by-project basis.

The CARB released the First Update to the Climate Change Scoping Plan in May 2014 to provide information on the development of measure-specific regulations and to adjust projections in consideration of the economic recession (CARB 2014a). To determine the amount of GHG emission reductions needed to achieve the goal of AB 32 (i.e., 1990 levels by 2020) CARB developed a forecast of the AB 32 Baseline 2020 emissions, which is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. CARB estimated the AB 32 Baseline 2020 to be 509 MMT CO₂e. The Scoping Plan's current estimate of the necessary GHG emission reductions is 78 MMT CO₂e (CARB 2014b). This represents an approximately 15.32 percent reduction. The CARB is forecasting that this would be achieved through the following reductions by sector: 25 MMT CO₂e for energy; 23 MMT CO₂e for transportation; 5 MMT CO₂e for high-GWP GHGs, and 2 MMT CO₂e for waste. The remaining 23 MMT CO₂e would be achieved through Cap-and-Trade Program reductions. This reduction is flexible; if CARB receives new

information and changes the other sectors' reductions to be less than expected, the agency can increase the Cap-and-Trade reduction (and vice versa).

In response to EO B-30-15 and SB 32, all state agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue driving down emissions. CARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The 2017 Climate Change Scoping Plan Update, Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, was released in draft form on January 20, 2017. The Second Update to the Scoping Plan is scheduled to be finalized in June 2017.

3.4 Local Policies and Plans: County of San Diego

3.4.1 County of San Diego General Plan

The County General Plan, as updated in 2011, includes a plan to balance population growth and development with infrastructure needs and resource protection. The current General Plan is based on smart growth and land planning principles that will reduce vehicle miles traveled (VMT) and, thus, result in a reduction of GHGs. This will be accomplished by locating future development within and near existing infrastructure. The General Plan includes a number of policies in the Conservation Element that encourage the design of new buildings that incorporate principles of sustainability and reduce vehicle and utility usage.

3.4.2 San Diego County Green Building Incentive Program

The County has a Green Building Incentive Program designed to promote the use of resource efficient construction materials, water conservation, and energy efficiency in new and remodeled residential and commercial buildings. The program offers incentives of reduced plan check turnaround time and a 7.5 percent reduction in plan check and building permit fees for projects meeting minimum program requirements, which include options for natural resource conservation, water conservation, and energy conservation.

3.4.3 County of San Diego Construction and Demolition Recycling Ordinance

The County has a construction and demolition recycling ordinance that is designed to divert debris from construction and demolition projects away from landfill disposal in the unincorporated County of San Diego. The ordinance requires that 90 percent of inerts and 70 percent of all other construction materials from a project be recycled. In order to comply with the ordinance, applicants must submit a Construction and Demolition Debris Management Plan and a fully refundable Performance Guarantee prior to building permit issuance.

3.4.4 San Diego Association of Governments: San Diego Forward: The Regional Plan

The Regional Plan (San Diego Association of Governments [SANDAG] 2015) is the long-range planning document developed to address the region's housing, economic, transportation, environmental, and overall quality-of-life needs. The Regional Plan establishes a planning framework and implementation actions that increase the region's sustainability and encourage "smart growth while preserving natural resources and limiting urban sprawl." The Regional Plan encourages the regions and the County to increase residential and employment concentrations in areas with the best existing and future transit connections, and to preserve important open spaces. The focus is on implementation of basic smart growth principles designed to strengthen the integration of land use and transportation.

4.0 GUIDELINES FOR DETERMINING SIGNIFICANCE

The assessment of climate change impacts is by its nature a cumulative impact, as no individual project has the ability to affect the climate on a global scale. Based on Appendix G.VII of the State CEQA Guidelines, a project would have a significant environmental impact if it would:

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

The County General Plan requires that the County adopt a Climate Action Plan (CAP) and thereafter GHG guidelines. At this time, the development of the CAP is being processed by the County under the supervision of a court pursuant to a judgment voiding a prior CAP. The County General Plan does not contain policies prohibiting the County from adopting a non-CAP-based threshold prior to adoption of a court-approved CAP. At this time, the County has not adopted GHG guidelines for general use as part of its environmental review process via an ordinance, resolution, rule or regulation developed through public review process (see CEQA Guidelines section 15064.7 [b]).

Accordingly, the determination of significance is governed by CEQA Guidelines 15064.4, entitled "Determining the Significance of Impacts from Greenhouse Gas Emissions." CEQA Guidelines 15064.4(a) states:

[t]he determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to ... [use a quantitative model or qualitative model] (emphasis added).

The analysis contained herein relies upon an efficiency metric not based on the future County CAP and not based upon guidelines adopted by a public hearing process. It is, rather, a metric based on the exercise of careful judgment about the setting of the Project, believed to be appropriate in the context of this particular Project.

The California Supreme Court in *Center for Biological Diversity v. California Department of Fish and Wildlife* (November 30, 2015, Case No. 217763, hereafter referred to as the Newhall Ranch decision), suggested several approaches for determining significance of GHG emissions that would be appropriate, but did not foreclose other methodologies that may be used by lead agencies. Some of the Court's suggested approaches were explored as described below in the context of its applicability to the proposed Project.

Performance-Based Reduction – BAU Approach

Performance-based approaches are based on a percentage reduction from a projected future condition. For example, reducing future business-as-usual (BAU) emissions by the AB 32 target of 29 percent (below 2020 BAU levels) through a combination of State measures, project design features (e.g., renewable energy), or mitigation is a performance-based approach. The performance-based approach is based on the project's reduction in emissions from an unmitigated condition. Based upon the Newhall Ranch decision, relating a given project to the achievement of State reduction would likely require adjustments to ARB's statewide BAU model not only to isolate new development emissions but also to consider unique geographic conditions that would be required to use the BAU performance-based methodology for a specific project. To date, this type of adjustment to the statewide BAU target has not been formulated and, therefore, is not appropriate for the Proposed Project's analysis.

Compliance with a Qualified GHG Reduction Plan

Under this approach, a qualified plan may be used in the cumulative impact analysis for later projects when the analysis "identifies those requirements specified in the plan that apply to the project." For a GHG reduction plan to be considered a qualified plan, it must meet certain criteria established under State CEQA Guidelines Sections 15183.5 (b) and 15064.4, also specified above. Consequently, if a project is consistent with a local CAP that was created to meet AB 32's GHG targets, then the project would be considered consistent with statewide GHG reduction goals for 2020. As discussed above, the San Diego County Superior Court set aside the approval of the County CAP and the County has not completed a new CAP that would set forth GHG reduction targets and reduction measures. Therefore, pending approval of the County's CAP, this approach was determined not to be appropriate for the Project's analysis.

Numerical Bright-Line

The screening level published by the California Air Pollution Control Officers Association (CAPCOA) was used for determining the need for additional analysis and mitigation for GHG-related impacts under CEQA. The CAPCOA white paper, *CEQA and Climate Change*, recommends a 900 MT CO₂e/year screening level to determine the size of projects that would be likely to have a less than considerable contribution to the cumulative impact of climate change. Projects exceeding this level would require further analysis and mitigation, as necessary

(CAPCOA 2008). As the proposed Project's emissions would exceed this screening level, further analysis is required.

Efficiency Metric (Per Service Population)

Another type of quantitative analysis approach is an efficiency-based metric. Efficiency metrics represent the GHG efficiency needed for development to achieve California's GHG emissions target established under AB 32. The intent of AB 32 is to accommodate a population and economic growth in California, but in a way that achieves a lower rate of GHG emissions statewide. Typical efficiency-based metrics are based on the land use sector (residential and commercial uses) and only account for land use-related emissions and residential population and employment. While the Newhall Ranch decision did not specifically recommend the efficiency-based approach, the ruling did note that efficiency metric approaches may be appropriate for determining significance of GHG emissions under particular circumstances.

An efficiency metric assesses the GHG efficiency of a project on a "service population (SP)" basis. The metric represents the rate of emissions needed to achieve a fair share of the State's emissions mandate embodied in AB 32. One method for determining a fair share contribution quantitatively is to determine if a project's per service person (i.e., residents and employees of the project) GHG efficiency level is more or less than the GHG efficiency level that would be needed for a jurisdiction to achieve the goals mandated by AB 32 and SB 32.

Based on this analysis, which included an examination of the limitations of each of these alternate approaches, it was determined that the efficiency metric is the most responsive to this Project given that these are the best emissions data available at this time. Furthermore, the efficiency metric approach is one of the methods for analyzing GHG emissions discussed in the *Biological Diversity v. California Department of Fish and Wildlife* (2015) 224 Cal.App.4th 1105 (Newhall Ranch case). Specifically, the Supreme Court noted that numeric approaches may be appropriate for determining significance of GHG emissions, and emphasized the consideration of GHG efficiency (62 Cal.4th at 220, 230). Therefore, the validity of using the efficiency metric approach is supported by the Supreme Court ruling in the Newhall Ranch case.

Efficiency metric analysis has also been recommended for land use sector projects by agencies such as the Bay Area Air Quality Management District (AQMD), the San Luis Obispo County Air Pollution Control District (APCD), and the South Coast AQMD. These agencies widely use this methodology, but consistent with the County, have not officially adopted it.

AEP's White Paper also specifically suggested the efficiency metric as one possible methodology for analyzing a project's GHG impacts post-Newhall Ranch: "Efficiency thresholds have been developed for land use sector projects based on AB 32 targets and are in common use by certain lead agencies." (Table 1: CEQA Project Significance Threshold Concepts in Light of the Newhall Ranch Ruling and Post-2020 Concerns, Page 8).

Three sources of GHG inventories were evaluated as the basis of developing an efficiency metric to use for the Project analysis. The first two sources are based on localized data for San Diego County and the third consists of data adjusted from the CARB's 2008 Scoping Plan. The comparison of GHG inventory sources provides evidence about the relationship between Project

emissions and assumptions made in the state's Scoping Plan to achieve statewide GHG reduction targets within AB 32 and SB 32.

As part of the San Diego County General Plan Update Environmental Impact Report (EIR) in 2011 (County 2011), a Greenhouse Gas Inventory was prepared by the County (County 2009). The GHG inventory report primarily used the (then current) 2008 University of San Diego's Energy Policy Initiatives Center (EPIC) GHG inventory for San Diego County as the source for the GHG emission estimates for 1990 and 2006, with emission projections to 2020 (Anders et al. 2008). Not all of the 14 categories in the EPIC study were included in the County's community inventory. Those that were not typically included in community inventories or were considered of limited relevance to the unincorporated area were not used. The land use sectors that were used included electricity (including water usage), natural gas, on-road transportation, off-road vehicles and equipment, waste, other fuels, wildfire, and livestock (County 2009). The GHG emissions inventory from County government facilities and operations was calculated using the Clean Air & Climate Protection model and separated from the community inventory. The County followed a basic approach for the community-wide emissions using a per capita method to calculate the portion of the County inventory allocated to the unincorporated County using SANDAG population estimates for a given analysis year. The 2009 GHG Inventory Report concluded that total community-wide emissions in the unincorporated County of San Diego in 1990 comprised approximately 5,139,821 MT of CO₂e (not including County government facility-related emissions). Thus, the total community-wide 2020 GHG emission target for the County in 2020 pursuant to EO S-3-05 would be 5,139,821 MT CO₂e/year. According to SANDAG, the unincorporated County of San Diego is estimated to have a total 2020 population of 545,451 with approximately 114,338 jobs. Thus, the 2020 service population for the County would be 659,789 (SANDAG 2016). In order to achieve the County emission level of 5,139,821 MT of CO₂e, in accordance with the County's General Plan, the efficiency target in 2020 would be approximately 7.8 MT CO₂e/SP/year.

To provide a more accurate estimate of community-wide GHG emissions than was reported in the General Plan Update EIR, the County updated its existing community-wide inventories for the 2012 Draft CAP using the methodologies described in the CARB Local Government Operations Protocol (LGOP) (CARB 2010b). Because the substantial data required for this protocol were not available for 1990 emissions, the County followed the CARB-recommended practice of reducing (then current) baseline emissions (2006 for government operations, 2005 for community-wide) by 15 percent to estimate 1990 emissions. The land use sectors included in the 2012 CAP included transportation, residential energy, commercial/industrial energy, agriculture, solid waste, wastewater, potable water, and other (construction, light commercial, industrial, lawn and gardening, and off-road vehicles) emissions. The 2012 CAP concluded that total emissions in the County of San Diego in 2005 (not including County government facility-related operations) comprised approximately 4,512,580 MT of CO₂e (County 2012). Accordingly, a 15 percent reduction from the baseline year GHG emissions in the County of San Diego would have totaled approximately 3,835,693 MT CO₂e/year. Thus, the total 2020 GHG emission target for the County pursuant to EO S-3-05 would be 3,835,693 MT CO₂e/year. Applying SANDAG's County 2020 service population of 659,789, the efficiency target in 2020 in accordance with the County's 2012 Draft CAP would be approximately 5.8 MT CO₂e/year.

To develop the efficiency metric for 2020 based on CARB's Scoping Plan, non-land use-related sectors in CARB's 1990 GHG inventory were removed to adjust the inventory to account specifically for land use projects. This process segregates out those emission sources that would not be applicable to land use projects. The land-use-driven sector inventory for 1990 was divided by the service population projections for California in 2020 (total of 59,130,546 service population). Data used to develop this metric are shown in Table 4, *2020 Efficiency Metric*, below. Based on these data, the 2020 efficiency metric would be 4.9 MT CO₂e/SP/year.

Table 4	
2020 EFFICIENCY METRIC	
CARB's 1990 California GHG Inventory	
1990 Total Emissions (MMT CO ₂ e)	431
1990 Non-land Use Emissions (MMT CO ₂ e)	(144.3)
1990 Land Use Emissions (MMT CO₂e)	286.7
California 2020 Service Population	
2020 Population Projection*	40,619,346
2020 Employment Projection**	+ 18,511,200
2020 Service Population	59,130,546
Efficiency Metric	
1990 Land Use Emissions (MT CO ₂ e)	286,700,000
2020 Service Population	59,130,546
2020 Efficiency Metric (MT CO₂e/SP/year)	4.9

Sources:

*California Department of Finance, Demographic Research Unit Report P-2, State and County Population Projections by Race/Ethnicity and Age (5-year groups) 2010 through 2060 (as of July 1); December 15, 2014.

**California Department of Finance, Employment Development Department Industry Employment Projections, Labor Market Information Division, 2010-2020; May 23, 2012.

Of the three GHG inventory sources, the 2020 efficiency metric derived from the adjusted CARB inventory data provide the most conservative limit for project-related GHG emissions, and is thus used in this analysis.

The Project is anticipated to be fully built out and operational in 2021. The post-2020 emissions target is based on SB 32, which mandates a statewide GHG emissions target of 40 percent below 1990 levels by 2030. CARB has indicated that an average statewide GHG reduction of 5.2 percent per year from 1990 emissions levels is necessary to achieve the 2030 emissions reduction goal identified in SB 32 (CARB 2015a). This metric is estimated by applying a uniform reduction from CARB's 1990 emissions inventory and dividing the resultant value by the projected statewide service population in 2021. Therefore, applying a 5.2 percent reduction to each year after 2020, the Project would need to achieve an efficiency metric of approximately 4.6 MT CO₂e/SP/year for the year 2021 to be consistent with the 2030 emissions reduction goal of SB 32.

Project emissions take into account applicable standards and regulations that the Project would need to comply with for buildout in 2021. These include effects on vehicle emissions due to Pavley I, Pavley II, LCFS, effects on energy emissions due to energy code enforcements and the Renewable Portfolios Standard (RPS) (to 33 percent), and applicable County policies.

5.0 IMPACT ANALYSIS

Emission estimates were calculated for the three GHGs of primary concern (CO₂, CH₄, and N₂O) that would be emitted from Project construction and from the Project's sources of operational emissions including on-road vehicular traffic, electricity generation, natural gas consumption, water usage, area sources, and solid waste disposal.

5.1 Methodology and Assumptions

Emissions calculations started with the following conservative land use assumption: The 111-acre Project would include the construction of 453 residential dwelling units; park and recreational uses; and an on-site WTWRF. The Project may also implement a bridge crossing of Escondido Creek. For purposes of conservative (worst-case) impact assessment, this activity has been incorporated into construction activities carried out by the Project. The first construction phase focuses on overall site grading, the second phase includes infrastructure installation (utility pipelines and roadways), and the third phase addresses “vertical” development of the Project (residential building and WTWRF construction, asphalt paving, and architectural coating). The potential bridge construction noted above would be accomplished within this phasing. Table 5, *Project Component Assumptions*, presents a summary of the land use designation, sizes and other metrics used for the California Emission Estimator Model (CalEEMod) (South Coast Air Quality Management District [SCAQMD] 2013).

Table 5 PROJECT COMPONENT ASSUMPTIONS			
Land Use Type	Land Use Subtype	Size	Metric
Residential	Single Family Housing	193	Dwelling Unit
Residential	Multi-Family Housing	260	Dwelling Unit
Retail	Strip Mall	5	1,000 square feet
Roadway	New Road Construction	2.2	Miles
Parking	Center House Parking Lot	46	Spaces
Recreational	City Park	1.5	Acres

5.1.1 Vehicle Emission Assumptions

CalEEMod is a computer model developed by a SCAQMD consultant with the input of several air quality management and pollution control districts to estimate criteria air pollutant emissions from various urban land uses (SCAQMD 2013). CalEEMod has the ability to calculate both mobile (i.e., vehicular) and some area source or stationary sources of emissions. It incorporates the two CARB off-road and on-road emissions models in its mobile emissions component and regional trip length and vehicle trip generation data from the participating air districts. CalEEMod and Roadway Model output data are provided in Appendix A.

The modeling assumes that the operational year of the Project is 2021 and uses emission factors based on that year. As allowed by the County, a reduction of 2.3 percent for Pavley II was applied to the CalEEMod results. CalEEMod already takes into account Pavley I and LCFS. See Appendix B for emission reduction adjustments.

5.1.2 Building Use Assumptions

GHG emissions resulting from electricity generation were estimated using the CalEEMod default values for the SDG&E region. The electricity energy use is in kilowatt-hours per size metric for each land use subtype and natural gas use is in kiloBritish Thermal Units (kBtu) per size metric for each land use subtype. The CalEEMod model default values are based on the CEC-sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies (SCAQMD 2013).

The Project is anticipated to be operational in 2021; therefore it would be required to comply with the 2016 Title 24 Energy Code. Title 24 2016 includes standards to achieve a minimum 46 percent greater energy efficiency to Title 24 regulated sources than Title 24 2008.² CalEEMod assumes compliance with Title 24 2008; therefore, in this analysis, estimates of Title 24 regulated energy emissions from the Project incorporates a 46 percent improvement in energy use rates over 2008 energy code standards.

5.1.3 WTWRF Assumptions

As described previously in Section 1.3, *Project Location and Description*, the Project design includes a new stand-alone on-site Aeromod WTWRF that would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000-gpd HGV plant design, new treatment processes with similar tank sizes would be constructed at HGV South.

Diesel-powered emergency generators would be used at the WTWRF for backup power during electric power failures. Generator emissions were estimated using CalEEMod. Emissions were calculated based on the annual testing frequency and duration and the power output of the engines. For the purposes of this analysis it was assumed that two 84 horsepower generators would operate for 8 hours per day, 260 days per year.

5.1.4 Construction Assumptions

CalEEMod and the Roadway Construction Emissions Model (Roadway Model) incorporate CARB's EMFAC2011 model for on-road vehicle emissions and the OFFROAD2011 model for off-road vehicle emissions (CARB 2012 and 2011). CalEEMod is designed to model construction emissions for land development projects while the Roadway Model is designed to model construction emissions for new or expanded roadway projects. Both models allow for the input of project-specific information, such as the number of equipment, hours of operations, duration of construction activities, and selection of emission control measures. The analysis assessed maximum daily emissions from individual construction activities, including site

² Based on CEC's FAQs for the 2013 update, "The 2013 Standards will use 25% less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 Standards" (CEC 2012). Based on the CEC's FAQs for the 2016 update, "Single family homes built to the 2016 standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards" (CEC 2016).
 $(1-25\%) \times (1-28\%) = 54\%$; $(1-54\%) = 46\%$

preparation, grading, backbone infrastructure, building construction, paving, and architectural coating.

Construction would require heavy equipment during mass grading, utility installations, building construction and paving, as well as potential bridge construction. Construction equipment estimates are based on default values in the Roadway Model and CalEEMod, as well as typical equipment used for the backbone infrastructure phase. Table 6, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 6 CONSTRUCTION EQUIPMENT ASSUMPTIONS		
Construction Phase	Equipment	Number
Site Prep and Blasting	Rubber Tired Dozers	3
	Tractors/Loaders/Backhoes	4
	Crushing/Proc. Equipment	1
Backbone Infrastructure	Forklift	1
	Off-Highway Truck	2
	Other Material Handling Equipment	1
	Tractors/Loaders/Backhoes	1
	Trenchers	1
Road Construction	Crawler Tractor	1
	Excavators	3
	Grader	1
	Roller	2
	Rubber Tired Loaders	1
	Scrapers	2
	Signal Boards	4
	Tractors/Loaders/Backhoes	2
Grading	Excavators	2
	Graders	1
	Rubber Tired Dozers	1
	Scrapers	2
	Tractors/Loaders/Backhoes	2
Bridge Construction	Cranes	2
	Forklift	1
	Tractors/Loaders/Backhoes	3
	Pumps	1
	Generators	2

Table 6 (cont.) CONSTRUCTION EQUIPMENT ASSUMPTIONS		
Construction Phase	Equipment	Number
Building Construction	Cranes	1
	Forklifts	3
	Generator sets	1
	Tractors/Loaders/Backhoes	3
	Welders	1
Parking Lot Paving	Pavers	2
	Paving Equipment	2
	Rollers	2
Architectural Coating	Air Compressors	1

Source: CalEEMod and Roadway Model (output data, including equipment horsepower, are provided in Appendix A).

Note: All equipment was assumed to operate 8 hours a day, with the exception of cranes and tractors/loaders/backhoes (7 hours per day) and air compressors (6 hours per day).

The construction schedule was determined by using CalEEMod defaults, input from the Project Applicant, and standard assumptions for similarly sized projects, taking into consideration the size of the Project in order to estimate necessary construction activities and length of days per construction activity. For example, a backbone infrastructure phase was added to the model to account for necessary Project trenching and utility installation. Roadway construction would occur during backbone infrastructure activity. As shown in Table 7, *Modeled Construction Schedule*, Project construction is assumed to start in July 2018 and is projected to be complete and operational in September 2021.

The quantity, duration, and the intensity of construction activity have an effect on the amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix than incorporated in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

Table 7
MODELED CONSTRUCTION SCHEDULE

Construction Activity	Construction Period		
	Start	End	Number of Working Days
Site Preparation and Blasting	07/01/2018	09/30/2018	65
Backbone Infrastructure	10/01/2018	03/31/2019	130
Road Construction	10/01/2018	03/31/2019	130
Grading	04/01/2019	06/30/2019	65
Bridge Construction	04/01/2019	03/31/2020	260
Building Construction	07/01/2019	09/30/2021	588
Parking Lot Paving	05/01/2021	09/30/2021	109
Architectural Coating	05/01/2021	09/30/2021	109

Source: CalEEMod and Roadway Model (output data are provided in Appendix A)

Blasting may be required at the site during initial site preparation and grading activity. Blasting operations would be conducted through the use of drilling and blasting to fracture rocks. At this time the exact amount of blasting has not been determined, however, it is assumed that approximately two to three blasting events may occur each week, with no more than one blast to occur per day. A single drill rig would be used to drill a pattern of bore holes to be loaded with carefully metered explosives.

Following blasting, the rock resource would be fractured and can be moved with conventional earthmoving equipment. A front-end loader will be used to spread the fractured rocks around the site for balanced cut/fill grading.

The Project would utilize ammonium nitrate/fuel oil (ANFO) explosives to conduct blasting on site. Uncontrolled CO₂, CH₄, and N₂O emissions are calculated using the emission factors of 73.96 kg/MM British thermal unit (Btu), 3x10⁻³ kg/MMBtu, and 6x10⁻⁴ kg/MMBtu, respectively, from 40 CFR 98, Tables C-1 and C-2 for distillate fuel oil No. 2. A diesel fuel oil to ammonium nitrate ratio of 9 percent and a diesel heating value of 19,300 Btu/pound of diesel fuel were used to express the CO₂, CH₄, and N₂O emission factors in terms of lbs/ton of ANFO.

5.2 Construction Emissions

Construction activities emit GHGs primarily through the combustion of fuels (mostly diesel) in the engines of off-road construction equipment and through the combustion of diesel and gasoline in the on-road construction vehicles and in the commute vehicles of the construction workers. Smaller amounts of GHGs are also emitted through the energy use embodied in any water use (for fugitive dust control) and lighting for the construction activity. Every phase of the construction process, including grading, building, and paving emits GHG emissions, in volumes proportional to the quantity and type of construction equipment used. The heavier equipment typically emits more GHGs per hour of use than the lighter equipment because of their greater fuel consumption and engine design.

Emissions of GHGs related to the construction of the Project would be temporary. As shown in Table 8, *Estimated Construction Emissions*, total GHG emissions associated with construction are estimated at 3,682 metric tons of CO₂e (MT CO₂e) for the duration of construction. For construction emissions, the County guidance recommends that the emissions be amortized over 20 years and added to the annual operational emissions. Amortized over 20 years, construction equipment would contribute 184 MT CO₂e per year to the Project's annual operational GHG emissions

<p>Table 8 ESTIMATED CONSTRUCTION EMISSIONS</p>	
Source	Emissions (MT CO₂e)
Site Preparation and Blasting	213
Backbone Infrastructure	242
Road Construction	407
Grading	186
Bridge Construction	874
Building Construction	1,613
Parking Lot Paving	113
Architectural Coating	34
TOTAL	3,682
Amortized Construction Emissions ¹	184

Model output data are provided in Appendix A

Note: Totals may not add up exactly due to rounding.

¹ Construction emissions are amortized over 20 years in accordance with County guidance.

5.3 Project Emissions

Operational sources of GHG emissions include: (1) vehicle use; (2) energy use (electricity and natural gas) and area sources (landscaping equipment; (3) solid waste generation; and (4) water conveyance and treatment. As noted earlier, the Project is assumed to be fully operational in 2021.

5.3.1 Vehicle Emissions

The Project would generate approximately 4,500 average daily trips (ADT) (Linscott, Law & Greenspan Engineers [LLG] 2017). CalEEMod estimated that the Project would result in an annual total of 11.08 million miles traveled each year. This total annual VMT was based on the average trip length calculated for this Project which was 7.88 miles per trip (LLG 2016; see Appendix C). Trip rates were based on the Traffic Impact Analysis (TIA), which estimated 9.93 daily trips per dwelling unit. The Project would result in vehicle-related emissions of 4,072 MT CO₂e annually.

5.3.2 Area Source Emissions

Area sources included emissions from residential fireplaces (i.e., natural gas hearths), landscaping equipment, architectural coatings, and household consumer products. GHG emissions associated with area sources were estimated using the CalEEMod default values for

the Proposed Project. The annual GHG emissions from area sources are estimated to be 329 MT CO_{2e} per year.

5.3.3 Energy Emissions

Buildings use electricity for lighting, heating and cooling. Electricity generation entails the combustion of fossil fuels, including natural gas and coal, which are then stored and transported to end users. A building's electricity use is thus associated with the off-site or indirect emission of GHGs at the source of electricity generation (power plant).

The Proposed Project would comply with the 2016 California Title 24 Energy Code (which went into effect on January 1, 2017). The following energy efficient items are planned for the housing development: improved HVAC systems; enhanced ceiling, attic and wall insulation; whole house fan installation; high-efficiency water heaters; energy-efficient three-coat stucco exteriors; programmable thermostat timers; roof anchors and pre-wiring to allow for the installation of PV systems; and high-efficiency window glazing.

Electric Vehicle Charging Station. The Center House parking area would include an electric car re-charging station.

Renewable Energy. The Project would also include the use of renewable energy which would provide 100 percent of Project's electricity needs (including residential uses, Center House, and WTWRF). Renewable energy would be provided through renewable sources to include, but not be limited to, rooftop solar and/or enrollment in SDG&E's SunRate, or equivalent, renewables program provided that the program can be verified to supply the electricity needs for the Project from renewable sources on a continuous basis. Using renewable energy displaces electricity demand which would ordinarily be supplied by the local utility. Since zero GHG emissions are associated with renewable energy, the GHG emissions reductions from this measure are equivalent to the emissions that would have been produced had electricity been supplied by the local utility.

With the implementation of energy-reducing project design features, the Project would result in the indirect emission of 306 MT CO_{2e} annually from energy usage (natural gas usage).

5.3.4 Water Use and Wastewater Treatment Emissions

Water-related GHG emissions are from the conveyance of potable water and treatment of wastewater. The California Energy Commission's 2006 Refining Estimates of Water-Related Energy Use in California defines average energy values for water in Southern California. These values are used in CalEEMod to establish default water-related emission factors.

As described in Section 1.4.2, *Project Design Features*, the Project includes several water conservation measures including the 2016 CALGreen mandate to reduce water consumption by 20 percent, the installation of the low flow water features, and the use of drought-tolerant landscape. These measures result in water-related GHG emissions of 193 MT CO_{2e} per year.

5.3.5 Solid Waste Emissions

Solid waste generated by the Project would also contribute to GHG emissions. Treatment and disposal of solid waste produces significant amounts of methane. Solid waste emissions were estimated using CalEEMod defaults, which are based on statewide average waste disposal rates obtained from the California Department of Resources Recycling and Recovery (CalRecycle) 1999 Statewide Waste Characterization Study. Through compliance with AB 341, the Project would achieve an average 75 percent diversion of waste during operations. This 75 percent reduction would result in solid waste-related emissions of 40 MT CO₂e per year.

5.3.6 Emissions Associated with Off-road Equipment

Diesel-powered emergency generators would be used at the WTWRF for backup power during electric power failures. Generator emissions were estimated using CalEEMod based on the annual testing frequency and duration and the power output of the engines. Stationary source emissions were estimated to be 147 MT CO₂e per year.

5.3.7 Summary

Table 9, *Estimated Operational Emissions with Project Design Features and State and Federal Mandates*, includes the annual emissions for the Project (including the WTWRF). The emissions include the amortized annual construction emissions anticipated for the Project. Appendix A contains the CalEEMod output files for the Proposed Project. As shown in Table 9, the Project would result in GHG emissions of 5,272 MT CO₂e per year in 2021.

Table 9 ESTIMATED OPERATIONAL EMISSIONS WITH PROJECT DESIGN FEATURES AND STATE AND FEDERAL MANDATES	
Source	Emissions (MT CO₂e)
Area	329
Energy	306
Mobile	4,072
Solid Waste	40
Water (including wastewater treatment)	193
WTWRF Generators	147
Operational Subtotal	5,088
Amortized Construction (Table 8)	184
TOTAL PROJECT	5,272

Source: HELIX 2016 – CalEEMod results are provided in Appendix A

Note: Emissions for the following sources were adjusted to include state-mandated reductions (as described above and in Appendix B of this report): energy, mobile, and water.

5.4 Significance of Impacts

OPR's Technical Advisory on CEQA and Climate Change (OPR 2008) states:

As with any environmental impact, lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact," individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice.

As detailed in Section 5.1.4, Project buildout is anticipated to occur in 2021. For projects that anticipate a buildout date after 2020, CARB has indicated that an average statewide GHG reduction of 5.2 percent per year is necessary to achieve the 2030 emissions reduction goal of EO B-30-15 (CARB 2015a). This metric is estimated by applying a uniform reduction from CARB's 1990 emissions inventory and dividing the resultant value by the projected service population in the buildout year.

Therefore, the impact significance determination in this report relies upon an efficiency metric based on compliance with the California's target of reducing 2030 GHG emissions to 40 percent below 1990 levels, consistent with SB 32. As noted above, the efficiency metric for 2021 is, therefore, 4.6 MT CO₂e/SP/year.

Based on SANDAG forecast data for the Project's census tract (census tract 203.07), on average, 2.63 residents are expected to reside in each dwelling unit and 18 jobs are anticipated to be generated per developed employment acre (SANDAG 2016). Therefore, the Project's 453 dwelling units would result in 1,191 residents and the 5,000 square feet of commercial development would result in 2 employees, for a total service population of 1,193 persons. As shown in Table 10, *GHG Emissions Significance Determination*, at full buildout the Proposed Project would result in emissions of 4.4 MT/SP/year. This is consistent with the stated 2021 efficiency metric, and therefore, the Project would result in less than significant GHG impacts.

Table 10	
GHG EMISSIONS SIGNIFICANCE DETERMINATION	
Category	Value
Total Project Emissions (MT CO ₂ e)	5,272
Project Service Population (residents)	1,193
Project Emissions per Service Population (MT CO ₂ e/SP/year)	4.4
2021 Efficiency Metric (MT CO ₂ e/SP/year)	4.6
Significant Impact?	No

Source: CalEEMod (output data are provided in Appendix A)

6.0 PROJECT CONSISTENCY WITH ADOPTED PLANS, POLICIES, AND REGULATIONS

The regulatory plans and policies discussed extensively in Section 3.0 above aim to reduce national, state, and local GHG emissions by primarily targeting the largest emitters of GHGs: the transportation and energy sectors. Plan goals and regulatory standards are thus largely focused on the automobile industry and public utilities. For the transportation sector, the reduction strategy is generally three-pronged: to reduce GHG emissions from vehicles by improving engine design; to reduce the carbon content of transportation fuels through research, funding, and incentives to fuel suppliers; and to reduce the miles these vehicles travel through land use change and infrastructure investments.

For the energy sector, the reduction strategies aim to reduce energy demand; impose emission caps on energy providers; establish minimum building energy and green building standards; transition to renewable non-fossil fuels; incentivize homeowners and builders; fully recover landfill gas for energy; expand research and development; and so forth.

6.1 State Plans

SB 32 and EO S-3-05 established GHG emission reduction targets for the state, and AB 32 launched the Climate Change Scoping Plan that outlined the reduction measures needed to reach these targets. The Project would emit 4.4 MT CO₂e/SP/year in 2021, which is lower than the 4.9 MT CO₂e/SP/year efficiency metric considered consistent with the AB 32's 2020 reduction target, and is also lower than the 4.6 MT CO₂e/SP/year efficiency metric that is considered on the State's reduction trajectory at buildout for meeting SB 32 and EO S-3-05's reduction targets.

6.2 Local Plans

As discussed above in Section 1.4, the Project would achieve some GHG reductions through green building design that includes improved energy efficiency, water conservation, sustainable materials use, and waste reduction. Verification and commissioning of these features would occur through independent third-party inspection and diagnostics.

As a condition of building permit approval, however, the Proposed Project is required to comply with 2016 Title 24 standards, reduce indoor water consumption by up to 20 percent, and have 100 percent of electricity generated by renewable sources. Verification of increased water and energy efficiencies will be demonstrated based on a performance approach, using a CEC-approved water and energy compliance software program, in the Title 24 Compliance Reports provided by the Project applicant to the County prior to issuance of the building permit.

The Project would result in 4.4 MT CO₂e/SP/year, which would be consistent with statewide GHG reduction targets established by AB 32 and SB 32. The Project's consistency with specific General Plan Conservation Element policies is analyzed in Table 11, *County General Plan Policies*.

Table 11
COUNTY GENERAL PLAN POLICIES

Policy	Project Consistency
<i>COS14.3 Sustainable Development.</i> Require design of residential subdivisions and nonresidential development through “green” and sustainable land development practices to conserve energy, water, open space, and natural resources.	<i>Consistent.</i> As discussed in Section 1.4 of this report, the Project includes many design features to reduce energy and water use.
<i>COS15.1 Design and Construction of New Buildings.</i> Require that new buildings be designed and constructed in accordance with “green building” programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of GHGs and toxic air contaminants.	<i>Consistent.</i> The Project proposes sustainability and efficiency features consistent with the CALGreen Building Code. The Project proposes to supply 100 percent of the Project’s electricity needs through renewable sources. The Project proposes implementing energy efficiency features that would achieve 2016 Title 24 requirements.
<i>COS15.4 Title 24 Energy Standards.</i> Require development to minimize energy impacts from new buildings in accordance with or exceeding Title 24 energy standards.	<i>Consistent.</i> The Project proposes implementing energy efficiency features that would meet 2016 Title 24 standards, which is more efficient than the 2008 Title 24 requirements that were current when the General Plan was adopted, and will be eligible for the County’s Green Building Incentive Program.
<i>COS17.2 Construction and Demolition Waste.</i> Require recycling, reduction and reuse of construction and demolition debris.	<i>Consistent.</i> The Project would prepare a Construction Debris Management Plan that complies with Section 68.508-68.518 of the County Municipal Code, and would divert 90 percent of inert construction materials and 70 percent of all other construction materials from landfills through reuse and recycling.
<i>COS17.6 Recycling Containers.</i> Require that all new land development projects include space for recycling containers.	<i>Consistent.</i> The Project would provide areas for storage and collection of recyclables and yard waste.
<i>COS19.1 Sustainable Development Practices.</i> Require land development, building design, landscaping, and operational practices that minimize water consumption.	<i>Consistent.</i> The Project proposes implementing water conservation strategies to reduce water usage by installing low-flow water features.

7.0 RESIDUAL IMPACTS AND CONCLUSIONS

As summarized in Table 10, implementation of the Project would result in GHG emissions of 4.4 MT CO₂e/SP/year. This meets the 2021 efficiency metric being applied to this analysis (4.6 MT CO₂e/SP/year). The Project would be consistent with the policies within the General Plan intended for the reduction of GHGs. Therefore, the Proposed Project GHG emission impacts would be less than significant.

8.0 HORIZON YEAR (2030 AND 2050) ANALYSIS

8.1 Post-2020 Targets

SB 32 was recently adopted by the Legislature to codify the interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030. The interim target was established to ensure California would effectively continue its trajectory toward meeting or exceeding the long-term emission reduction statewide goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in EO S-3-05. There has been no legislative action to adopt the 2050 GHG reduction targets. Although SB 32 was recently adopted by the Legislature, there is no currently adopted statewide GHG reduction plan or framework that extends beyond 2020. Also, no agency with subject matter expertise has adopted regulations to achieve these statewide goals at the project-level. Meeting these post 2020 targets will require substantial effort at the state, regional, and local levels. Although a local government's land use decisions plays a role in assisting the state in meeting the long-term GHG emissions targets, ultimately AB 32 and SB 32 require that the State meet the long-term GHG emissions targets, not an individual projects.

The State and CARB are working toward adopting regulatory programs and frameworks designed to support meeting statewide post-2020 reduction goals. For example, the Scoping Plan First Update includes some post-2020 concepts (reduction measures) that are currently underway. CARB is also moving forward with a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The 2017 Climate Change Scoping Plan Update, Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, was released in draft form on January 20, 2017. As stated above, while there has been activity at the legislative, executive, and judicial levels, there are currently no adopted plans or measures that specifically prescribe how the post-2020 targets will be met.

CEQA Guidelines 15064.4(a) permits both quantitative and qualitative analysis. Therefore, this analysis assesses whether or not a project is overall consistent with, meaning not interfering with, programs CARB identified in its First Update as capable of assisting the state in meeting its long-term GHG emissions targets. The data point for this qualitative analysis is the substantial evidence CARB relied upon in its First Update to the Scoping Plan to conclude that California was on track to meet the 2030 and 2050 state GHG targets and analyzes in a qualitative manner whether the Project interferes with the programs CARB identified in the First Update as providing a means for the state to achieve these long- term state targets.

CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014a). With regard to the 2050 target for reducing GHG emissions to 80 percent below 1990 levels, the First Update to the Climate Change Scoping Plan states:

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts [MW] of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by

2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, the experts at CARB attest the state is on a trajectory to meet the 2020, 2030, and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05.

The Scoping Plan First Update discusses a number of strategies currently underway that have led to significant emission reductions and provides a summary of recommended actions the state could take to meet long-term reduction goals. The draft 2017 Climate Change Scoping Plan Update includes a detailed roadmap by accelerating the focus on continued investment in renewables, greater use of low carbon fuels including electricity and hydrogen, stronger efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases), and further efforts to create walkable communities with expanded mass transit and other alternatives to traveling by car. Strengthening of the LCFS and expansion of the zero emissions vehicles program will likely result in further reductions to mobile source emissions. Additionally, the RPS would likely continue beyond the 2020 goal of 33 percent. Continuing the cap-and-trade program and ensuring that natural lands become carbon sinks provide additional emissions reductions and flexibility in meeting the target (CARB 2014a).

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts [MW] of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

This discussion evaluates whether the Project's post-buildout GHG emissions trajectory would impede the attainment of the 2030 and 2050 GHG reduction goals identified in SB 32 and EO S-3-05. As noted above, in qualitatively evaluating the Project's emissions for consistency with SB 32 and EO B-30-15, it is important to note that some of these broad-scale shifts in how energy is produced and used are outside of the control of the Project. The changes necessitated by the State of California's long-term climate policy will require additional policy and regulatory changes, which are unknown at this time. As a consequence, the extent to which the Project's emissions and resulting impacts would be mitigated through implementation of such changes is not known. Furthermore, implementation of such additional policy and regulatory changes is in the jurisdiction of state-level agencies (e.g., CARB), not the County or the Project. Nonetheless, this analysis renders a determination as to whether the Proposed Project would conflict with or impede substantial progress towards the statewide reduction goals established by SB 32 for 2030 and by EO S-3-05 for 2050.

The following discussion evaluates whether the Proposed Project would interfere with the four main programs CARB identified to support its conclusions that the state is on a trajectory to meet the 2030 and 2050 GHG targets: (1) initiative to install 12,000 megawatts [MW] of renewable

distributed energy by 2020; (2) CBC mandate to construct net zero energy homes after 2020; (3) existing building retrofits under AB 758; and (4) California's Cap-and-Trade Regulations.

8.2 State's Goal to Install 12,000 MW of Renewable Distributed Generation Systems by 2020

The Project does not interfere with the state's goal to install 12,000 MW of renewable distributed generation systems by 2020. The Project includes a Project Design Feature to supply 100 percent of the Project's electricity needs through renewable sources. Therefore, the Project would not interfere or conflict with the state's goal of 12,000 MW of renewable distributed generation by 2020.

8.3 Non-interference with Construction of Net-Zero Energy Homes After 2020

The Project does not interfere with the ability of the California Building Commission to mandate constructing net-zero energy homes after 2020. The Proposed Project is anticipated to start construction in 2018 with full buildout expected by 2021. The Project would be required to construct homes in conformance with the current California Building Commission mandates because the County does not issue occupancy permits for projects that do not comply with the California Building Code in effect at that time.

8.4 Non-interference with AB 758's Existing Buildings Energy Efficiency Action Plan

The Project would not interfere with the state's implementation of building retrofits to further energy efficiency for existing buildings under AB 758 or SB 350. The CEC is tasked with developing and implementing a comprehensive program to increase energy efficiency in existing residential and nonresidential buildings that "fall significantly below the current standards in Title 24" (Pub. Resources Code, section 25943[a][1]). The Project would be constructed in compliance with the applicable Title 24 standards and therefore would not interfere with CEC or other initiatives implemented to increase energy efficiency and reduce GHG emissions associated with buildings that do not adhere to Title 24 standards.

8.5 Other State Programs – Cap-and-Trade

Cap-and-trade was initially identified in the 2008 Scoping Plan, and carried forward in the draft 2017 Climate Change Scoping Plan Update, as a strategy for helping California reduce its GHG emissions (CARB 2008b). A cap-and-trade program sets the total amount of GHG emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. AB 32 required CARB to adopt the cap-and-trade regulation by January 1, 2011, and the program itself began in November 2012. The Cap-and-Trade Regulation is being implemented in two stages. Electric generating utilities, electricity importers, and large industrial facilities became subject to the program beginning in 2013, and fuel distributors were brought under the cap in 2015. The Project does not interfere with the state's implementation of this GHG reducing program because it is not an electric generating utility, electricity importer, large industrial facility, or fuel distributor. Rather, the Project, like all consumers of energy and fuel from the sources regulated by Cap-and-Trade will have the related GHG emissions reduced from these resources as the generators must invest heavily in GHG reducing technologies in order to comply with the ever

decreasing cap. In this sense, similar to all consumers paying for the use of fuel and electricity resources, the Project and its residents would contribute financially toward these GHG reducing technologies.

Based on the foregoing, the Project does not conflict with nor interfere with the state's implementation of SB 32's target of reducing statewide GHG emissions to 40 percent below 1990 levels by 2030 or EO S-3-05's target of reducing statewide GHG emission to 80 percent below 1990 levels by 2050 because it would not interfere with the state's implementation of GHG emission reduction measures described in CARB's First Update to the Scoping Plan, including the state providing for 12,000 MW of renewable distributed generation by 2020, CARB's draft 2017 Climate Change Scoping Plan Second Update, the California Building Commission mandating new zero energy homes in the building code after 2020, existing building retrofits under AB 758, and Cap-and-Trade Regulations. CARB identified these programs to reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050.

9.0 REFERENCES

- American Petroleum Institute (API). 2004. API Compendium of GHG Emissions Estimation Methodologies for the Oil and Gas Industry.
- Anders, S.J., D.O. De Haan, N. Silva-Send, S.T. Tanaka, L. Tyner. 2008. University of San Diego School of Law Energy Policy Initiative Center (EPIC). San Diego County Greenhouse Gas Inventory: An Analysis of Regional Emissions and Strategies to Achieve AB 32 Targets. September.
- Association of Environmental Professionals (AEP). 2007. Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents. June.
- California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures. August. Available at: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>.
- 2008 CEQA and Climate Change. January. Available at: <http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf>
- California Air Resources Board (CARB). 2015a. 2030 Target Scoping Plan Update (presentation dated October 1, 2015). November 19. Available at: <http://www.arb.ca.gov/board/books/2015/111915/15-9-5pres.pdf>.
- 2015b California Greenhouse Gas Inventory for 2000-2013 – By Sector and Activity. April 24.
- 2014a First Update to the AB 32 Scoping Plan. May 14. Available at: <http://www.arb.ca.gov/cc/scopingplan/document/updatescopingplan2013.htm>
- 2014b California Greenhouse Gas Inventory Program (last update December 22). Available at: <http://www.arb.ca.gov/cc/inventory/inventory.htm>.
- 2013 Clean Car Standards – Pavley, Assembly Bill 1493. Accessed September 2014. Available at: <http://www.arb.ca.gov/cc/ccms/ccms.htm>
- 2012 Mobile Source Emissions Inventory Model (EMFAC2011). Available at: <http://www.arb.ca.gov/msei/modeling.htm>
- 2011 OFFROAD2011 Emission Factors.
- 2010a Greenhouse Gas Inventory Data – 2000 to 2008 (last update May 12, 2010). Available at: <http://www.arb.ca.gov/cc/inventory/data/data.htm>.

California Air Resources Board (CARB) (cont.)

2010b Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories, Version 1.1. May. Available at: https://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf

2008a Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act, October 24, 2008. Available at: <http://www.arb.ca.gov/cc/localgov/ceqa/ceqa.htm>.

2008b AB 32 Climate Change Scoping Plan Document. December. Available at: <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>.

2007a Staff Report: California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit. November 16.

2007b California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit. November 16.

2007c Climate Change: Information Regarding ARB's Climate Change Program Pursuant to 2006 Assembly Bill 32. Available at: <http://www.arb.ca.gov/cc/cc.htm>.

2007d Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration. October.

2006 Public Workshop to Discuss Establishing the 1990 Emission Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions, Sacramento, CA. December 1.

California Building Standards Commission (CBSC). 2016. Adopted 2016 Code, Triennial California Building Standards Commission (CBSC). Adopted 2016 Code, Triennial Edition. Sacramento, CA: CBSC. Available at: <http://www.bsc.ca.gov/>

California Department of Finance, Demographic Research Unit Report P-2, State and County Population Projections by Race/Ethnicity and Age (5-year groups) 2010 through 2060 (as of July 1); December 15, 2014. Available at: <http://www.dof.ca.gov/research/demographic/projections/>.

California Department of Finance, Employment Development Department Industry Employment Projections, Labor Market Information Division, 2010-2020; May 23, 2012. Available at: <http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html>.

California Energy Commission (CEC). 2016. 2016 Building Energy Efficiency Standards. Available at: <http://www.energy.ca.gov/title24/2016standards/>.

2012 News Release – Energy Commission Approves More Efficient Buildings for California’s Future. Sacramento, CA: CEC. May 31. Available at: http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html

2006 Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. December.

California Natural Resources Agency (CNRA). 2009. California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008. Available at: http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf.

County of San Diego (County). 2012. Draft Final County of San Diego Climate Action Plan. June.

2011 San Diego County General Plan Update Final Environmental Impact Report. Land Use and Environmental Group, Department of Planning and Land Use, Department of Public Works. August. Available at: <http://www.sandiegocounty.gov/content/sdc/pds/gpupdate/environmental.html>.

2009 Draft 2009 Greenhouse Gas Emissions Inventory. Land Use and Environment Group – Department of Planning and Land Use. June.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis, Summary for Policy Makers (Working Group Fourth Assessment Report). February. Available at: <http://www.ipcc.ch/SPM2feb07.pdf>.

Linscott, Law & Greenspan Engineers (LLG). 2017. Traffic Impact Analysis – Harmony Grove Parcel. February.

2016 Harmony Grove Village South Traffic Study – Average Trip Length memorandum. June.

San Diego Association of Governments (SANDAG). 2016. Series 13 Regional Growth Forecast: Census Tract 203.07. Available at: <http://datasurfer.sandag.org/api/forecast/13/tract/203.07/export/pdf>. Accessed June 2016.

2015 San Diego Forward: The Regional Plan. October. Available at: http://www.sdforward.com/pdfs/RP_final/The%20Plan%20-%20combined.pdf

South Coast Air Quality Management District (SCAQMD). 2013. California Emission Estimator Model (CalEEMod). (Released October 2013). Prepared by ENVIRON under contract with South Coast Air Quality Management District. Version 2013.2.2. Available at: <http://www.aqmd.gov/caleemod/default.htm>.

United Nations Environment Programme. 2007a. Scientific Assessment of Ozone Depletion: 2006. Pursuant to Article 6 of the Montreal Protocol on Substances that Deplete the Ozone Layer. February.

2007b Achievements in Stratospheric Ozone Protection, the Montreal Protocol on Substances that Deplete the Ozone Layer, Progress Report 1987–2007. Available at: http://ozone.unep.org/Publications/MP_Achievements-E.pdf

United States Environmental Protection Agency (USEPA). 2015. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013. April 15. Available at: <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>

2011 (November 22, last update). Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. Washington, D.C.: USEPA. Available at: <http://www.epa.gov/climatechange/endangerment/>

2010 Inventory of Greenhouse Gas Emissions and Sinks: 1990 to 2008. U.S. EPA #430-R-10-066. <http://epa.gov/climatechange/emissions/usinventoryreport.html>.

2006 The U.S. Inventory of Greenhouse Gas Emissions and Sinks: Fast Facts. Available at: www.epa.gov/climatechange/emissions/downloads06/06FastFacts.pdf.

World Resources Institute. 2017. CAIT 2.0: Climate Data Explorer. Available at: <http://cait2.wri.org/wri/>

10.0 LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED

Preparers:

Victor Ortiz, Air Quality Specialist
Amy Mila de la Roca, Air Quality Analyst
Joanne M. Dramko, AICP, County-approved Air Quality Consultant

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Contacts:

County of San Diego
Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123



Appendix A

CALEEMOD AND ROADWAY MODEL OUTPUT DATA



Harmony Grove Village South

San Diego County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	46.00	Space	0.41	18,400.00	0
City Park	1.50	Acre	1.50	65,340.00	0
Condo/Townhouse	260.00	Dwelling Unit	16.25	260,000.00	744
Single Family Housing	193.00	Dwelling Unit	62.66	347,400.00	552
Strip Mall	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2021
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MW hr)	720.49	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on input from Kovach (dated 02-27-2017)

Off-road Equipment -

Off-road Equipment - typical equipment used for the backbone infrastructure phase

Off-road Equipment - Based on input from Moffatt & Nichol

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Crusher added to process Blasing debris

Trips and VMT -

Grading -

Architectural Coating - Low-VOC coatings per design feature

Vehicle Trips - Trip generation based on LLG2014; trip length based on LLG2016.

Construction Off-road Equipment Mitigation -

Area Mitigation - Natural Gas hearths and low-VOC coatings per design features

Energy Mitigation - CalEEMod default is 2008 T24. 2013 is 25% improved over 2008. 2016 is 28% improved over 2013. $(1-.25)*(1-.28)=54\%$ - 46% improvement

Water Mitigation -

Waste Mitigation -

Operational Off-Road Equipment - WTWRF generator sets

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	100.00

tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	1,550.00	262.00
tblConstructionPhase	NumDays	1,550.00	589.00
tblConstructionPhase	NumDays	155.00	65.00
tblConstructionPhase	NumDays	110.00	109.00
tblConstructionPhase	NumDays	60.00	65.00
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/30/2020	3/31/2020
tblConstructionPhase	PhaseEndDate	7/4/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	6/28/2019	6/30/2019
tblConstructionPhase	PhaseEndDate	3/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	9/28/2018	9/30/2018
tblConstructionPhase	PhaseEndDate	3/29/2019	3/31/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblConstructionPhase	PhaseStartDate	7/1/2019	4/1/2019
tblConstructionPhase	PhaseStartDate	4/1/2020	7/1/2019
tblConstructionPhase	PhaseStartDate	10/1/2021	5/1/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00

tblProjectCharacteristics	OperationalYear	2014	2021
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	CW_TL	9.50	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	HW_TL	10.80	7.88
tblVehicleTrips	ST_TR	1.59	0.00
tblVehicleTrips	ST_TR	7.16	9.93
tblVehicleTrips	ST_TR	10.08	9.93
tblVehicleTrips	ST_TR	42.04	0.00
tblVehicleTrips	SU_TR	1.59	0.00
tblVehicleTrips	SU_TR	6.07	9.93
tblVehicleTrips	SU_TR	8.77	9.93
tblVehicleTrips	SU_TR	20.43	0.00
tblVehicleTrips	WD_TR	1.59	0.00
tblVehicleTrips	WD_TR	6.59	9.93
tblVehicleTrips	WD_TR	9.57	9.93
tblVehicleTrips	WD_TR	44.32	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					
2018	0.2571	2.5760	1.9592	2.9200e-003	0.5963	0.1344	0.7307	0.3252	0.1245	0.4497	0.0000	263.4093	263.4093	0.0756	0.0000	264.9973
2019	0.9145	7.7422	8.0294	0.0162	0.7449	0.3819	1.1268	0.2413	0.3585	0.5998	0.0000	1,330.0340	1,330.0340	0.2136	0.0000	1,334.5198
2020	0.5716	4.1474	5.5395	0.0119	0.4512	0.2049	0.6560	0.1213	0.1930	0.3143	0.0000	925.7016	925.7016	0.1109	0.0000	928.0311
2021	3.0949	2.8710	4.1013	8.6600e-003	0.3014	0.1418	0.4431	0.0809	0.1327	0.2136	0.0000	673.4264	673.4264	0.1001	0.0000	675.5289
Total	4.8381	17.3365	19.6294	0.0398	2.0937	0.8629	2.9567	0.7686	0.8088	1.5774	0.0000	3,192.5712	3,192.5712	0.5003	0.0000	3,203.0771

2.1 Overall Construction

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					
2018	0.2571	2.5760	1.9592	2.9200e-003	0.2734	0.1344	0.4078	0.1477	0.1245	0.2722	0.0000	263.4090	263.4090	0.0756	0.0000	264.9970
2019	0.9145	7.7422	8.0294	0.0162	0.5898	0.3819	0.9717	0.1770	0.3585	0.5355	0.0000	1,330.0330	1,330.0330	0.2136	0.0000	1,334.5189
2020	0.5716	4.1474	5.5395	0.0119	0.4512	0.2049	0.6560	0.1213	0.1930	0.3143	0.0000	925.7011	925.7011	0.1109	0.0000	928.0306
2021	3.0949	2.8710	4.1013	8.6600e-003	0.3014	0.1418	0.4431	0.0809	0.1327	0.2136	0.0000	673.4259	673.4259	0.1001	0.0000	675.5285
Total	4.8381	17.3365	19.6294	0.0398	1.6158	0.8629	2.4787	0.5268	0.8088	1.3356	0.0000	3,192.5690	3,192.5690	0.5003	0.0000	3,203.0749

	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
Percent Reduction	0.00	0.00	0.00	0.00	22.83	0.00	16.17	31.46	0.00	15.33	0.00	0.00	0.00	0.00	0.00	0.00

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	32.2773	0.4246	38.3867	0.0139		4.9380	4.9380		4.9379	4.9379	467.9298	201.7382	669.6681	0.4372	0.0368	690.2581
Energy	0.0482	0.4117	0.1754	2.6300e-003		0.0333	0.0333		0.0333	0.0333	0.0000	1,322.634 1	1,322.634 1	0.0432	0.0158	1,328.434 3
Mobile	2.2319	4.3212	21.8268	0.0609	4.1659	0.0685	4.2343	1.1141	0.0632	1.1773	0.0000	4,168.447 4	4,168.447 4	0.1580	0.0000	4,171.765 7
Offroad	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Waste						0.0000	0.0000		0.0000	0.0000	71.3107	0.0000	71.3107	4.2143	0.0000	159.8119
Water						0.0000	0.0000		0.0000	0.0000	9.4812	202.0455	211.5267	0.9819	0.0247	239.7970
Total	34.6503	5.9807	61.3470	0.0791	4.1659	5.0834	9.2492	1.1141	5.0780	6.1921	548.7217	6,041.819 2	6,590.540 9	5.8421	0.0773	6,737.178 5

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	3.1238	0.0389	3.3731	1.8000e-004		0.0410	0.0410		0.0408	0.0408	0.0000	326.6201	326.6201	0.0115	5.8900e-003	328.6863
Energy	0.0308	0.2628	0.1120	1.6800e-003		0.0212	0.0212		0.0212	0.0212	0.0000	304.3124	304.3124	5.8300e-003	5.5800e-003	306.1644
Mobile	2.2319	4.3212	21.8268	0.0609	4.1659	0.0685	4.2343	1.1141	0.0632	1.1773	0.0000	4,168.4474	4,168.4474	0.1580	0.0000	4,171.7657
Offroad	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Waste						0.0000	0.0000		0.0000	0.0000	17.8277	0.0000	17.8277	1.0536	0.0000	39.9530
Water						0.0000	0.0000		0.0000	0.0000	7.5849	163.2919	170.8768	0.7855	0.0197	193.4867
Total	5.4793	5.4462	26.2699	0.0644	4.1659	0.1743	4.3402	1.1141	0.1688	1.2830	25.4126	5,109.6257	5,135.0383	2.0219	0.0312	5,187.1675

	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
Percent Reduction	84.45	22.70	58.74	20.66	0.00	97.43	53.55	0.00	97.53	79.99	95.37	17.86	24.31	65.52	59.62	25.19

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2018	9/30/2018	5	65	
2	Backbone Infrastructure	Trenching	10/1/2018	3/31/2019	5	130	
3	Grading	Grading	4/1/2019	6/30/2019	5	65	
4	Bridge Construction	Building Construction	4/1/2019	3/31/2020	5	262	
5	Building Construction	Building Construction	7/1/2019	9/30/2021	5	589	
6	Paving	Paving	5/1/2021	9/30/2021	5	109	
7	Architectural Coating	Architectural Coating	5/1/2021	9/30/2021	5	109	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 162.5

Acres of Paving: 0

Residential Indoor: 1,229,985; Residential Outdoor: 409,995; Non-Residential Indoor: 106,338; Non-Residential Outdoor: 35,446 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crushing/Proc. Equipment	1	8.00	85	0.78
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Backbone Infrastructure	Forklifts	1	8.00	89	0.20
Backbone Infrastructure	Off-Highway Trucks	2	8.00	400	0.38
Backbone Infrastructure	Other Material Handling Equipment	1	8.00	167	0.40
Backbone Infrastructure	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Backbone Infrastructure	Trenchers	1	8.00	80	0.50
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41

Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Bridge Construction	Cranes	2	7.00	226	0.29
Bridge Construction	Forklifts	1	8.00	89	0.20
Bridge Construction	Generator Sets	2	8.00	84	0.74
Bridge Construction	Pumps	1	8.00	84	0.74
Bridge Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Bridge Construction	Welders	0	8.00	46	0.45
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Backbone Infrastructure	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Construction	9	293.00	63.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	293.00	63.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	59.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2018

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					0.5872	0.0000	0.5872	0.3228	0.0000	0.3228	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1615	1.6298	1.3206	1.5000e-003		0.0877	0.0877		0.0815	0.0815	0.0000	135.7510	135.7510	0.0380	0.0000	136.5480
Total	0.1615	1.6298	1.3206	1.5000e-003	0.5872	0.0877	0.6748	0.3228	0.0815	0.4043	0.0000	135.7510	135.7510	0.0380	0.0000	136.5480

3.2 Site Preparation - 2018**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	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991
Total	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991

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					0.2642	0.0000	0.2642	0.1452	0.0000	0.1452	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1615	1.6298	1.3206	1.5000e-003		0.0877	0.0877		0.0815	0.0815	0.0000	135.7508	135.7508	0.0380	0.0000	136.5479
Total	0.1615	1.6298	1.3206	1.5000e-003	0.2642	0.0877	0.3519	0.1452	0.0815	0.2268	0.0000	135.7508	135.7508	0.0380	0.0000	136.5479

3.2 Site Preparation - 2018**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	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991
Total	1.8400e-003	2.4400e-003	0.0229	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.4945	4.4945	2.2000e-004	0.0000	4.4991

3.3 Backbone Infrastructure - 2018**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	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7411	119.7411	0.0373	0.0000	120.5239
Total	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7411	119.7411	0.0373	0.0000	120.5239

3.3 Backbone Infrastructure - 2018**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	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263
Total	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263

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	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7409	119.7409	0.0373	0.0000	120.5237
Total	0.0924	0.9419	0.5982	1.3100e-003		0.0467	0.0467		0.0429	0.0429	0.0000	119.7409	119.7409	0.0373	0.0000	120.5237

3.3 Backbone Infrastructure - 2018

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	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263
Total	1.4000e-003	1.8600e-003	0.0174	5.0000e-005	3.9700e-003	3.0000e-005	4.0000e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.4227	3.4227	1.7000e-004	0.0000	3.4263

3.3 Backbone Infrastructure - 2019

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	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2035	114.2035	0.0361	0.0000	114.9623
Total	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2035	114.2035	0.0361	0.0000	114.9623

3.3 Backbone Infrastructure - 2019**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	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022
Total	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022

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	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2033	114.2033	0.0361	0.0000	114.9621
Total	0.0816	0.8021	0.5639	1.2700e-003		0.0395	0.0395		0.0364	0.0364	0.0000	114.2033	114.2033	0.0361	0.0000	114.9621

3.3 Backbone Infrastructure - 2019**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	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022
Total	1.2600e-003	1.6700e-003	0.0156	5.0000e-005	3.8500e-003	3.0000e-005	3.8800e-003	1.0200e-003	3.0000e-005	1.0500e-003	0.0000	3.1989	3.1989	1.5000e-004	0.0000	3.2022

3.4 Grading - 2019**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					0.2819	0.0000	0.2819	0.1169	0.0000	0.1169	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1590	1.7614	1.3094	2.0100e-003		0.0814	0.0814		0.0749	0.0749	0.0000	180.1829	180.1829	0.0570	0.0000	181.3801
Total	0.1590	1.7614	1.3094	2.0100e-003	0.2819	0.0814	0.3633	0.1169	0.0749	0.1918	0.0000	180.1829	180.1829	0.0570	0.0000	181.3801

3.4 Grading - 2019**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	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362
Total	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362

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					0.1269	0.0000	0.1269	0.0526	0.0000	0.0526	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1590	1.7614	1.3094	2.0100e-003		0.0814	0.0814		0.0749	0.0749	0.0000	180.1827	180.1827	0.0570	0.0000	181.3799
Total	0.1590	1.7614	1.3094	2.0100e-003	0.1269	0.0814	0.2083	0.0526	0.0749	0.1275	0.0000	180.1827	180.1827	0.0570	0.0000	181.3799

3.4 Grading - 2019**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	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362
Total	1.7000e-003	2.2600e-003	0.0211	6.0000e-005	5.2100e-003	4.0000e-005	5.2500e-003	1.3900e-003	4.0000e-005	1.4200e-003	0.0000	4.3319	4.3319	2.1000e-004	0.0000	4.3362

3.5 Bridge Construction - 2019**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	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0689	340.0689	0.0655	0.0000	341.4450
Total	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0689	340.0689	0.0655	0.0000	341.4450

3.5 Bridge Construction - 2019**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	0.0567	0.4453	0.7322	1.4700e-003	0.0404	6.6900e-003	0.0471	0.0116	6.1600e-003	0.0177	0.0000	127.1286	127.1286	9.5000e-004	0.0000	127.1485
Worker	0.0756	0.1002	0.9348	2.8500e-003	0.2314	1.6800e-003	0.2331	0.0615	1.5600e-003	0.0631	0.0000	192.3389	192.3389	9.2200e-003	0.0000	192.5326
Total	0.1323	0.5455	1.6670	4.3200e-003	0.2718	8.3700e-003	0.2802	0.0731	7.7200e-003	0.0808	0.0000	319.4675	319.4675	0.0102	0.0000	319.6811

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	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0685	340.0685	0.0655	0.0000	341.4445
Total	0.2948	2.8800	2.2056	3.8700e-003		0.1621	0.1621		0.1546	0.1546	0.0000	340.0685	340.0685	0.0655	0.0000	341.4445

3.5 Bridge Construction - 2019**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	0.0567	0.4453	0.7322	1.4700e-003	0.0404	6.6900e-003	0.0471	0.0116	6.1600e-003	0.0177	0.0000	127.1286	127.1286	9.5000e-004	0.0000	127.1485
Worker	0.0756	0.1002	0.9348	2.8500e-003	0.2314	1.6800e-003	0.2331	0.0615	1.5600e-003	0.0631	0.0000	192.3389	192.3389	9.2200e-003	0.0000	192.5326
Total	0.1323	0.5455	1.6670	4.3200e-003	0.2718	8.3700e-003	0.2802	0.0731	7.7200e-003	0.0808	0.0000	319.4675	319.4675	0.0102	0.0000	319.6811

3.5 Bridge Construction - 2020**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	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9573	110.9573	0.0212	0.0000	111.4031
Total	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9573	110.9573	0.0212	0.0000	111.4031

3.5 Bridge Construction - 2020**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	0.0177	0.1251	0.2333	4.8000e-004	0.0133	1.9800e-003	0.0153	3.8100e-003	1.8200e-003	5.6300e-003	0.0000	40.9868	40.9868	3.0000e-004	0.0000	40.9931
Worker	0.0236	0.0309	0.2883	9.4000e-004	0.0764	5.5000e-004	0.0769	0.0203	5.1000e-004	0.0208	0.0000	60.9048	60.9048	2.8900e-003	0.0000	60.9656
Total	0.0413	0.1560	0.5216	1.4200e-003	0.0897	2.5300e-003	0.0922	0.0241	2.3300e-003	0.0264	0.0000	101.8916	101.8916	3.1900e-003	0.0000	101.9587

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	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9571	110.9571	0.0212	0.0000	111.4030
Total	0.0875	0.8626	0.7137	1.2800e-003		0.0464	0.0464		0.0442	0.0442	0.0000	110.9571	110.9571	0.0212	0.0000	111.4030

3.5 Bridge Construction - 2020**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	0.0177	0.1251	0.2333	4.8000e-004	0.0133	1.9800e-003	0.0153	3.8100e-003	1.8200e-003	5.6300e-003	0.0000	40.9868	40.9868	3.0000e-004	0.0000	40.9931
Worker	0.0236	0.0309	0.2883	9.4000e-004	0.0764	5.5000e-004	0.0769	0.0203	5.1000e-004	0.0208	0.0000	60.9048	60.9048	2.8900e-003	0.0000	60.9656
Total	0.0413	0.1560	0.5216	1.4200e-003	0.0897	2.5300e-003	0.0922	0.0241	2.3300e-003	0.0264	0.0000	101.8916	101.8916	3.1900e-003	0.0000	101.9587

3.6 Building Construction - 2019**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	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5210	154.5210	0.0376	0.0000	155.3105
Total	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5210	154.5210	0.0376	0.0000	155.3105

3.6 Building Construction - 2019

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	0.0380	0.2984	0.4906	9.8000e-004	0.0270	4.4800e-003	0.0315	7.7400e-003	4.1200e-003	0.0119	0.0000	85.1826	85.1826	6.4000e-004	0.0000	85.1960
Worker	0.0507	0.0671	0.6264	1.9100e-003	0.1551	1.1300e-003	0.1562	0.0412	1.0400e-003	0.0423	0.0000	128.8768	128.8768	6.1800e-003	0.0000	129.0066
Total	0.0887	0.3655	1.1170	2.8900e-003	0.1821	5.6100e-003	0.1877	0.0490	5.1600e-003	0.0541	0.0000	214.0594	214.0594	6.8200e-003	0.0000	214.2026

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	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5208	154.5208	0.0376	0.0000	155.3104
Total	0.1552	1.3837	1.1299	1.7700e-003		0.0848	0.0848		0.0798	0.0798	0.0000	154.5208	154.5208	0.0376	0.0000	155.3104

3.6 Building Construction - 2019**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	0.0380	0.2984	0.4906	9.8000e-004	0.0270	4.4800e-003	0.0315	7.7400e-003	4.1200e-003	0.0119	0.0000	85.1826	85.1826	6.4000e-004	0.0000	85.1960
Worker	0.0507	0.0671	0.6264	1.9100e-003	0.1551	1.1300e-003	0.1562	0.0412	1.0400e-003	0.0423	0.0000	128.8768	128.8768	6.1800e-003	0.0000	129.0066
Total	0.0887	0.3655	1.1170	2.8900e-003	0.1821	5.6100e-003	0.1877	0.0490	5.1600e-003	0.0541	0.0000	214.0594	214.0594	6.8200e-003	0.0000	214.2026

3.6 Building Construction - 2020**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	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973
Total	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1514	302.1514	0.0736	0.0000	303.6973

3.6 Building Construction - 2020**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	0.0712	0.5043	0.9404	1.9500e-003	0.0537	7.9800e-003	0.0617	0.0154	7.3400e-003	0.0227	0.0000	165.2082	165.2082	1.2200e-003	0.0000	165.2339
Worker	0.0951	0.1245	1.1619	3.7900e-003	0.3078	2.2400e-003	0.3100	0.0818	2.0700e-003	0.0839	0.0000	245.4932	245.4932	0.0117	0.0000	245.7381
Total	0.1663	0.6289	2.1024	5.7400e-003	0.3615	0.0102	0.3717	0.0971	9.4100e-003	0.1066	0.0000	410.7014	410.7014	0.0129	0.0000	410.9720

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	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969
Total	0.2766	2.5000	2.2019	3.5100e-003		0.1458	0.1458		0.1371	0.1371	0.0000	302.1510	302.1510	0.0736	0.0000	303.6969

3.6 Building Construction - 2020**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	0.0712	0.5043	0.9404	1.9500e-003	0.0537	7.9800e-003	0.0617	0.0154	7.3400e-003	0.0227	0.0000	165.2082	165.2082	1.2200e-003	0.0000	165.2339
Worker	0.0951	0.1245	1.1619	3.7900e-003	0.3078	2.2400e-003	0.3100	0.0818	2.0700e-003	0.0839	0.0000	245.4932	245.4932	0.0117	0.0000	245.7381
Total	0.1663	0.6289	2.1024	5.7400e-003	0.3615	0.0102	0.3717	0.0971	9.4100e-003	0.1066	0.0000	410.7014	410.7014	0.0129	0.0000	410.9720

3.6 Building Construction - 2021**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	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9104	224.9104	0.0542	0.0000	226.0482
Total	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9104	224.9104	0.0542	0.0000	226.0482

3.6 Building Construction - 2021**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	0.0499	0.3078	0.6720	1.4500e-003	0.0400	5.3400e-003	0.0453	0.0114	4.9200e-003	0.0164	0.0000	122.7641	122.7641	9.1000e-004	0.0000	122.7831
Worker	0.0674	0.0870	0.8199	2.8200e-003	0.2291	1.6900e-003	0.2308	0.0609	1.5700e-003	0.0624	0.0000	179.6661	179.6661	8.3500e-003	0.0000	179.8416
Total	0.1173	0.3948	1.4918	4.2700e-003	0.2690	7.0300e-003	0.2761	0.0723	6.4900e-003	0.0788	0.0000	302.4302	302.4302	9.2600e-003	0.0000	302.6247

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	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9101	224.9101	0.0542	0.0000	226.0479
Total	0.1846	1.6907	1.6124	2.6100e-003		0.0931	0.0931		0.0875	0.0875	0.0000	224.9101	224.9101	0.0542	0.0000	226.0479

3.6 Building Construction - 2021

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	0.0499	0.3078	0.6720	1.4500e-003	0.0400	5.3400e-003	0.0453	0.0114	4.9200e-003	0.0164	0.0000	122.7641	122.7641	9.1000e-004	0.0000	122.7831
Worker	0.0674	0.0870	0.8199	2.8200e-003	0.2291	1.6900e-003	0.2308	0.0609	1.5700e-003	0.0624	0.0000	179.6661	179.6661	8.3500e-003	0.0000	179.8416
Total	0.1173	0.3948	1.4918	4.2700e-003	0.2690	7.0300e-003	0.2761	0.0723	6.4900e-003	0.0788	0.0000	302.4302	302.4302	9.2600e-003	0.0000	302.6247

3.7 Paving - 2021

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	0.0671	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8063	106.8063	0.0345	0.0000	107.5317
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0676	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8063	106.8063	0.0345	0.0000	107.5317

3.7 Paving - 2021**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	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464
Total	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464

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	0.0671	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8062	106.8062	0.0345	0.0000	107.5316
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0676	0.6900	0.7822	1.2200e-003		0.0363	0.0363		0.0334	0.0334	0.0000	106.8062	106.8062	0.0345	0.0000	107.5316

3.7 Paving - 2021**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	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464
Total	1.9300e-003	2.4900e-003	0.0235	8.0000e-005	6.5600e-003	5.0000e-005	6.6000e-003	1.7400e-003	4.0000e-005	1.7900e-003	0.0000	5.1414	5.1414	2.4000e-004	0.0000	5.1464

3.8 Architectural Coating - 2021**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	2.7040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0119	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353
Total	2.7159	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353

3.8 Architectural Coating - 2021

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	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426
Total	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426

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	2.7040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0119	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353
Total	2.7159	0.0832	0.0991	1.6000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	13.9152	13.9152	9.5000e-004	0.0000	13.9353

3.8 Architectural Coating - 2021

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	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426
Total	7.5900e-003	9.7900e-003	0.0923	3.2000e-004	0.0258	1.9000e-004	0.0260	6.8500e-003	1.8000e-004	7.0300e-003	0.0000	20.2229	20.2229	9.4000e-004	0.0000	20.2426

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	2.2319	4.3212	21.8268	0.0609	4.1659	0.0685	4.2343	1.1141	0.0632	1.1773	0.0000	4,168.4474	4,168.4474	0.1580	0.0000	4,171.7657
Unmitigated	2.2319	4.3212	21.8268	0.0609	4.1659	0.0685	4.2343	1.1141	0.0632	1.1773	0.0000	4,168.4474	4,168.4474	0.1580	0.0000	4,171.7657

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Condo/Townhouse	2,581.80	2,581.80	2,581.80	6,358,684	6,358,684
Parking Lot	0.00	0.00	0.00		
Single Family Housing	1,916.49	1,916.49	1,916.49	4,720,100	4,720,100
Strip Mall	0.00	0.00	0.00		
Total	4,498.29	4,498.29	4,498.29	11,078,785	11,078,785

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
City Park	7.88	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	7.88	7.30	7.50	41.60	18.80	39.60	86	11	3
Parking Lot	7.88	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	7.88	7.30	7.50	41.60	18.80	39.60	86	11	3
Strip Mall	7.88	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.512811	0.073496	0.191363	0.130940	0.036084	0.005147	0.012550	0.023118	0.001871	0.002053	0.006546	0.000576	0.003444

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Percent of Electricity Use Generated with Renewable 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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	845.8687	845.8687	0.0341	7.0400e-003	848.7674
NaturalGas Mitigated	0.0308	0.2628	0.1120	1.6800e-003		0.0212	0.0212		0.0212	0.0212	0.0000	304.3124	304.3124	5.8300e-003	5.5800e-003	306.1644
NaturalGas Unmitigated	0.0482	0.4117	0.1754	2.6300e-003		0.0333	0.0333		0.0333	0.0333	0.0000	476.7654	476.7654	9.1400e-003	8.7400e-003	479.6669

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					
Parking Lot	0	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
Single Family Housing	5.33712e+006	0.0288	0.2459	0.1047	1.5700e-003		0.0199	0.0199		0.0199	0.0199	0.0000	284.8092	284.8092	5.4600e-003	5.2200e-003	286.5425
Strip Mall	11450	6.0000e-005	5.6000e-004	4.7000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6110	0.6110	1.0000e-005	1.0000e-005	0.6147
City Park	0	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
Condo/Townhouse	3.58567e+006	0.0193	0.1652	0.0703	1.0500e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.3452	191.3452	3.6700e-003	3.5100e-003	192.5097
Total		0.0482	0.4117	0.1754	2.6200e-003		0.0333	0.0333		0.0333	0.0333	0.0000	476.7654	476.7654	9.1400e-003	8.7400e-003	479.6669

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					
Parking Lot	0	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
Single Family Housing	3.39866e+006	0.0183	0.1566	0.0666	1.0000e-003		0.0127	0.0127		0.0127	0.0127	0.0000	181.3653	181.3653	3.4800e-003	3.3300e-003	182.4691
Strip Mall	8690	5.0000e-005	4.3000e-004	3.6000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.4637	0.4637	1.0000e-005	1.0000e-005	0.4666
City Park	0	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
Condo/Townhouse	2.29525e+006	0.0124	0.1058	0.0450	6.8000e-004		8.5500e-003	8.5500e-003		8.5500e-003	8.5500e-003	0.0000	122.4833	122.4833	2.3500e-003	2.2500e-003	123.2288
Total		0.0308	0.2628	0.1120	1.6800e-003		0.0212	0.0212		0.0212	0.0212	0.0000	304.3124	304.3124	5.8400e-003	5.5900e-003	306.1644

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.12689e+006	368.2782	0.0148	3.0700e-003	369.5402
Parking Lot	16192	5.2917	2.1000e-004	4.0000e-005	5.3098
Single Family Housing	1.37498e+006	449.3569	0.0181	3.7400e-003	450.8967
Strip Mall	70200	22.9420	9.2000e-004	1.9000e-004	23.0206
Total		845.8687	0.0340	7.0400e-003	848.7674

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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	3.1238	0.0389	3.3731	1.8000e-004		0.0410	0.0410		0.0408	0.0408	0.0000	326.6201	326.6201	0.0115	5.8900e-003	328.6863
Unmitigated	32.2773	0.4246	38.3867	0.0139		4.9380	4.9380		4.9379	4.9379	467.9298	201.7382	669.6681	0.4372	0.0368	690.2581

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	1.0323					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7188					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	28.4240	0.3856	35.0154	0.0137		4.9194	4.9194		4.9193	4.9193	467.9298	196.2430	664.1728	0.4318	0.0368	684.6510
Landscaping	0.1022	0.0389	3.3714	1.8000e-004		0.0186	0.0186		0.0186	0.0186	0.0000	5.4953	5.4953	5.3300e-003	0.0000	5.6072
Total	32.2773	0.4246	38.3867	0.0139		4.9380	4.9380		4.9379	4.9379	467.9298	201.7382	669.6681	0.4372	0.0368	690.2581

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	0.2704					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7188					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0325	0.0000	1.7700e-003	0.0000		0.0224	0.0224		0.0222	0.0222	0.0000	321.1248	321.1248	6.1500e-003	5.8900e-003	323.0791
Landscaping	0.1022	0.0389	3.3714	1.8000e-004		0.0186	0.0186		0.0186	0.0186	0.0000	5.4953	5.4953	5.3300e-003	0.0000	5.6072
Total	3.1238	0.0389	3.3731	1.8000e-004		0.0410	0.0410		0.0408	0.0408	0.0000	326.6201	326.6201	0.0115	5.8900e-003	328.6863

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	170.8768	0.7855	0.0197	193.4867
Unmitigated	211.5267	0.9819	0.0247	239.7970

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.78722	6.4891	2.6000e-004	5.0000e-005	6.5114
Condo/Townhouse	16.94 / 10.6796	116.2365	0.5565	0.0140	132.2487
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12.5747 / 7.92755	86.2833	0.4131	0.0104	98.1692
Strip Mall	0.370363 / 0.226996	2.5177	0.0122	3.0000e-004	2.8677
Total		211.5267	0.9819	0.0247	239.7970

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.46929	5.3348	2.1000e-004	4.0000e-005	5.3531
Condo/Townhouse	13.552 / 8.77981	93.8466	0.4451	0.0112	106.6524
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	10.0598 / 6.51732	69.6631	0.3304	8.2800e-003	79.1689
Strip Mall	0.29629 / 0.186616	2.0324	9.7300e-003	2.4000e-004	2.3123
Total		170.8768	0.7855	0.0197	193.4867

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.8277	1.0536	0.0000	39.9530
Unmitigated	71.3107	4.2143	0.0000	159.8119

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.13	0.0264	1.5600e-003	0.0000	0.0591
Condo/Townhouse	119.6	24.2777	1.4348	0.0000	54.4079
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	226.32	45.9409	2.7150	0.0000	102.9566
Strip Mall	5.25	1.0657	0.0630	0.0000	2.3883
Total		71.3107	4.2143	0.0000	159.8119

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.0325	6.6000e-003	3.9000e-004	0.0000	0.0148
Condo/Townhouse	29.9	6.0694	0.3587	0.0000	13.6020
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	56.58	11.4852	0.6788	0.0000	25.7391
Strip Mall	1.3125	0.2664	0.0158	0.0000	0.5971
Total		17.8277	1.0536	0.0000	39.9530

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Generator Sets	2	8.00	260	84	0.74	Diesel

UnMitigated/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
Equipment Type	tons/yr										MT/yr					
Generator Sets	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114
Total	0.0929	0.8232	0.9580	1.7100e-003		0.0436	0.0436		0.0436	0.0436	0.0000	146.9539	146.9539	7.5000e-003	0.0000	147.1114

10.0 Vegetation

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> HGVS															
Project Phases (Pounds)		ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing		1.22	8.27	13.22	10.57	0.57	10.00	2.59	0.51	2.08	0.02	1,929.94	0.44	0.02	1,947.53
Grading/Excavation		6.50	48.98	71.74	13.40	3.40	10.00	5.17	3.09	2.08	0.09	8,846.84	2.47	0.09	8,934.21
Drainage/Utilities/Sub-Grade		5.64	42.89	56.71	12.93	2.93	10.00	4.80	2.72	2.08	0.07	7,241.41	1.61	0.07	7,302.26
Paving		2.22	19.03	20.79	1.32	1.32	0.00	1.19	1.19	0.00	0.03	3,128.22	0.75	0.03	3,157.24
Maximum (pounds/day)		6.50	48.98	71.74	13.40	3.40	10.00	5.17	3.09	2.08	0.09	8,846.84	2.47	0.09	8,934.21
Total (tons/construction project)		0.33	2.53	3.50	0.74	0.17	0.56	0.28	0.16	0.12	0.00	444.54	0.11	0.00	448.66
Notes: Project Start Year -> Project Length (months) -> Total Project Area (acres) -> Maximum Area Disturbed/Day (acres) -> Water Truck Used? ->		2018													
		6													
		13													
		1													
		Yes													
		Total Material Imported/Exported Volume (yd³/day)			Daily VMT (miles/day)										
Phase		Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck								
Grubbing/Land Clearing		0	0	0	0	320	40								
Grading/Excavation		0	0	0	0	800	40								
Drainage/Utilities/Sub-Grade		0	0	0	0	720	40								
Paving		0	0	0	0	560	40								
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.															
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.															
CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.															
Total Emission Estimates by Phase for -> HGVS															
Project Phases		ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
(Tons for all except CO2e. Metric tonnes for CO2e)															
Grubbing/Land Clearing		0.01	0.05	0.09	0.07	0.00	0.07	0.02	0.00	0.01	0.00	12.74	0.00	0.00	11.66
Grading/Excavation		0.17	1.29	1.89	0.35	0.09	0.26	0.14	0.08	0.05	0.00	233.56	0.07	0.00	213.97
Drainage/Utilities/Sub-Grade		0.13	0.99	1.31	0.30	0.07	0.23	0.11	0.06	0.05	0.00	167.28	0.04	0.00	153.03
Paving		0.02	0.19	0.21	0.01	0.01	0.00	0.01	0.01	0.00	0.00	30.97	0.01	0.00	28.36
Maximum (tons/phase)		0.17	1.29	1.89	0.35	0.09	0.26	0.14	0.08	0.05	0.00	233.56	0.07	0.00	213.97
Total (tons/construction project)		0.33	2.53	3.50	0.74	0.17	0.56	0.28	0.16	0.12	0.00	444.54	0.11	0.00	407.02
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.															
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.															
CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.															
The CO2e emissions are reported as metric tons per phase.															

Road Construction Emissions Model Data Entry Worksheet		Version 8.1.0																																								
<p><small>Note: Required data input sections have a yellow background. Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background. The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types. Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.</small></p>																																										
<div style="display: flex; justify-content: space-between;"> <div> <p>Input Type</p> <p>Project Name</p> <p>Construction Start Year</p> <p>Project Type</p> <p>Project Construction Time</p> <p>Working Days per Month</p> <p>Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small></p> <p>Project Length</p> <p>Total Project Area</p> <p>Maximum Area Disturbed/Day</p> <p>Water Trucks Used?</p> </div> <div style="border: 1px solid black; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: yellow;">HGVS</td></tr> <tr><td style="background-color: yellow;">2018</td></tr> <tr><td style="background-color: yellow;">1</td></tr> <tr><td style="background-color: yellow;">6.00</td></tr> <tr><td style="background-color: yellow;">22.00</td></tr> <tr><td style="background-color: yellow;">1</td></tr> <tr><td style="background-color: yellow;">1.80</td></tr> <tr><td style="background-color: yellow;">13.00</td></tr> <tr><td style="background-color: yellow;">1.00</td></tr> <tr><td style="background-color: yellow;">1</td></tr> </table> </div> <div style="font-size: 0.8em;"> <p>Enter a Year between 2014 and 2025 (inclusive)</p> <p>1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction</p> <p>months days (assume 22 if unknown)</p> <p>1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)</p> <p>miles acres acre</p> <p>1. Yes 2. No</p> </div> </div>				HGVS	2018	1	6.00	22.00	1	1.80	13.00	1.00	1																													
HGVS																																										
2018																																										
1																																										
6.00																																										
22.00																																										
1																																										
1.80																																										
13.00																																										
1.00																																										
1																																										
<div style="display: flex; justify-content: space-between;"> <div> <p>Material Hauling Quantity Input</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Material Type</th> <th style="width: 10%;">Phase</th> <th style="width: 20%;">Haul Truck Capacity (yd³) (assume 20 if unknown)</th> <th style="width: 20%;">Import Volume (yd³/day)</th> <th style="width: 30%;">Export Volume (yd³/day)</th> </tr> </thead> <tbody> <tr><td rowspan="4">Soil</td><td>Grubbing/Land Clearing</td><td></td><td></td><td></td></tr> <tr><td>Grading/Excavation</td><td></td><td></td><td></td></tr> <tr><td>Drainage/Utilities/Sub-Grade</td><td></td><td></td><td></td></tr> <tr><td>Paving</td><td></td><td></td><td></td></tr> <tr><td rowspan="4">Asphalt</td><td>Grubbing/Land Clearing</td><td></td><td></td><td></td></tr> <tr><td>Grading/Excavation</td><td></td><td></td><td></td></tr> <tr><td>Drainage/Utilities/Sub-Grade</td><td></td><td></td><td></td></tr> <tr><td>Paving</td><td></td><td></td><td></td></tr> </tbody> </table> </div> <div style="font-size: 0.8em;"> <p>Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.</p> <p>http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries</p> </div> </div>				Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)	Soil	Grubbing/Land Clearing				Grading/Excavation				Drainage/Utilities/Sub-Grade				Paving				Asphalt	Grubbing/Land Clearing				Grading/Excavation				Drainage/Utilities/Sub-Grade				Paving			
Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)																																						
Soil	Grubbing/Land Clearing																																									
	Grading/Excavation																																									
	Drainage/Utilities/Sub-Grade																																									
	Paving																																									
Asphalt	Grubbing/Land Clearing																																									
	Grading/Excavation																																									
	Drainage/Utilities/Sub-Grade																																									
	Paving																																									
<p>Mitigation Options</p> <div style="display: flex;"> <div style="width: 35%;"> <p>On-road Fleet Emissions Mitigation</p> <p>Off-road Equipment Emissions Mitigation</p> </div> <div style="width: 65%; border: 1px solid black; padding: 5px;"> <p>Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer</p> <p>Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml).</p> <p>Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard</p> </div> </div>																																										

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing		0.60		1/1/2018
Grading/Excavation		2.40		1/20/2018
Drainage/Utilities/Sub-Grade		2.10		4/3/2018
Paving		0.90		6/6/2018
Totals (Months)		6		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input		Miles/Round Trip	Miles/Round Trip	Round Trips/Day	Round Trips/Day	Daily VMT					
Miles/round trip: Grubbing/Land Clearing			30.00		0	0.00					
Miles/round trip: Grading/Excavation			30.00		0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade			30.00		0	0.00					
Miles/round trip: Paving			30.00		0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Grubbing/Land Clearing (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Drainage/Utilities/Sub-Grade (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
User Input						
Miles/round trip: Grubbing/Land Clearing			30.00		0	0.00
Miles/round trip: Grading/Excavation			30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade			30.00		0	0.00
Miles/round trip: Paving			30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated		Calculated					
User Input						Daily Trips		Daily VMT					
Miles/ one-way trip				20									
One-way trips/day				2									
No. of employees: Grubbing/Land Clearing				8		16		320.00					
No. of employees: Grading/Excavation				20		40		800.00					
No. of employees: Drainage/Utilities/Sub-Grade				18		36		720.00					
No. of employees: Paving				14		28		560.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
Grubbing/Land Clearing (grams/mile)		0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91		
Grading/Excavation (grams/mile)		0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91		
Draining/Utilities/Sub-Grade (grams/mile)		0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91		
Paving (grams/mile)		0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91		
Grubbing/Land Clearing (grams/trip)		1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49		
Grading/Excavation (grams/trip)		1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49		
Draining/Utilities/Sub-Grade (grams/trip)		1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49		
Paving (grams/trip)		1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49		
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
Pounds per day - Grubbing/Land Clearing		0.06	1.05	0.11	0.03	0.01	0.00	280.94	0.01	0.00	282.53		
Tons per const. Period - Grubbing/Land Clearing		0.00	0.01	0.00	0.00	0.00	0.00	1.85	0.00	0.00	1.86		
Pounds per day - Grading/Excavation		0.15	2.62	0.28	0.08	0.03	0.01	702.34	0.02	0.01	706.33		
Tons per const. Period - Grading/Excavation		0.00	0.07	0.01	0.00	0.00	0.00	18.54	0.00	0.00	18.65		
Pounds per day - Drainage/Utilities/Sub-Grade		0.14	2.36	0.25	0.07	0.03	0.01	632.11	0.02	0.01	635.69		
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.05	0.01	0.00	0.00	0.00	14.60	0.00	0.00	14.68		
Pounds per day - Paving		0.11	1.84	0.20	0.06	0.02	0.00	491.64	0.01	0.01	494.43		
Tons per const. Period - Paving		0.00	0.02	0.00	0.00	0.00	0.00	4.87	0.00	0.00	4.89		
Total tons per construction project		0.01	0.15	0.02	0.00	0.00	0.00	39.86	0.00	0.00	40.09		

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of Default # Water Trucks		Program Estimate of Number of Water Trucks		User Override of Truck Miles Traveled/Vehicle/Day		Default Values Miles Traveled/Vehicle/Day		Calculated Daily VMT			
User Input													
Grubbing/Land Clearing - Exhaust				1				40.00		40.00			
Grading/Excavation - Exhaust				1				40.00		40.00			
Drainage/Utilities/Subgrade				1				40.00		40.00			
Paving				1				40.00		40.00			
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
Grubbing/Land Clearing (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93		
Grading/Excavation (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93		
Draining/Utilities/Sub-Grade (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93		
Paving (grams/mile)		0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93		
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
Pounds per day - Grubbing/Land Clearing		0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62		
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.93		
Pounds per day - Grading/Excavation		0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62		
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	3.74		
Pounds per day - Drainage/Utilities/Sub-Grade		0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62		
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	3.24	0.00	0.00	3.27		
Pounds per day - Paving		0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62		
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.00	1.40		
Total tons per construction project		0.00	0.00	0.01	0.00	0.00	0.00	9.26	0.00	0.00	9.35		

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust		User Override of Max Acreage Disturbed/Day		Default Maximum Acreage/Day		PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing				1.00		10.00	0.07	2.08	0.01
Fugitive Dust - Grading/Excavation				1.00		10.00	0.26	2.08	0.05
Fugitive Dust - Drainage/Utilities/Subgrade				1.00		10.00	0.23	2.08	0.05

Off-Road Equipment Emissions														
Default		Mitigation Option												
Grubbing/Land Clearing	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	1		Model Default Tier	Crawler Tractors	0.63	2.61	8.34	0.32	0.29	0.01	775.49	0.24	0.01	
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	1		Model Default Tier	Excavators	0.30	3.38	3.19	0.15	0.14	0.01	536.03	0.17	0.00	
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	If non-default vehicles are used, please provide information in "Non-default Off-road Equipment" tab		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing				pounds per day	1.16	7.19	12.98	0.53	0.49	0.02	1,508.77	0.43	0.01
	Grubbing/Land Clearing				tons per phase	0.01	0.05	0.09	0.00	0.00	0.00	9.96	0.00	10.05

Grading/Excavation	Default		Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type											
Override of Default Number of Vehicles		Program-estimate			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0		Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Crawler Tractors	0.63	2.61	8.34	0.32	0.29	0.01	775.49	0.24	0.01	783.53	
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Excavators	0.90	10.14	9.58	0.46	0.43	0.02	1,608.08	0.50	0.01	1,624.78	
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Graders	0.84	4.69	8.36	0.47	0.43	0.01	629.41	0.20	0.01	635.92	
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rollers	0.52	3.92	5.05	0.35	0.32	0.01	534.41	0.17	0.00	539.95	
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Rubber Tired Loaders	0.42	1.71	5.25	0.18	0.16	0.01	619.57	0.19	0.01	626.01	
	2		Model Default Tier	Scrapers	2.26	17.33	28.00	1.10	1.01	0.03	3,008.05	0.94	0.03	3,039.27	
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26	
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.54	4.72	5.31	0.38	0.35	0.01	632.00	0.20	0.01	638.55	
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment															
	Number of Vehicles	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
			Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Grading/Excavation		pounds per day	6.34	46.33	71.33	3.31	3.05	0.08	8,004.27	2.45	0.07	8,086.26	
		Grading/Excavation		tons per phase	0.17	1.22	1.88	0.09	0.08	0.00	211.31	0.06	0.00	213.48	

Data Entry Worksheet 6

Paving	Default		Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default												
	Override of Default Number of Vehicles	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier												
	Program-estimate		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pavers	0.32	2.84	3.50	0.17	0.16	0.00	458.58	0.14	0.00		463.33
	1		Model Default Tier	Paving Equipment	0.24	2.52	2.64	0.13	0.12	0.00	406.90	0.13	0.00		411.13
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Rollers	0.78	5.88	7.57	0.52	0.48	0.01	801.62	0.25	0.01		809.93
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00		198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.54	4.72	5.31	0.38	0.35	0.01	632.00	0.20	0.01		638.55
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment						ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
If non-default vehicles are used, please provide information in "Non-default Off-road Equipment" tab						pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Number of Vehicles		Equipment Tier		Type											
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving				pounds per day	2.10	17.16	20.46	1.25	1.16	0.03	2,496.35	0.74	0.02		2,521.19
Paving				tons per phase	0.02	0.17	0.20	0.01	0.01	0.00	24.71	0.01	0.00		24.96
Total Emissions all Phases (tons per construction period) =>						0.32	2.38	3.47	0.17	0.16	0.00	395.42	0.11	0.00	399.22

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Drilling and Blasting

			Blast Frequency			
ID	Source	holes/blast	blasts/day	blasts/month	blasts/ year	Tons ANFO/ Blast
B-1	Blasting Activity	100	1	12	36	1.25

Blasting Gases - ANFO Emission Factors

ID	Source	CO EF lb/ton	NOX EF lb/ton	SOx EF lb/ton	CO2 EF lb/ton	CH4 EF lb/ton	N2O EF lb/ton
B-1	Blasting Activity	67	17	2	566	0.02	0.005

Blasting Gases - ANFO Emission Rates Greenhouse Gases

ID	Emissions	CO2 (lb/hr)	CO2 (lb/day)	CO2 (TPY)	CH4 (lb/hr)	CH4 (lb/day)	CH4 (TPY)	N2O (lb/hr)	N2O (lb/day)	N2O (TPY)	Source Type
B-1	Blasting Activity	707.50	707.50	12.74	0.03	0.03	0.0005	0.0063	0.0063	0.2250	Area

Notes:

1. Emission Factor Source: AP-42 5th Edition, Section 13.3, Table 13.3-1, February 1980, ND = no data.

Uncontrolled CO₂, CH₄, and N₂O emissions are calculated using the emission factors of 73.96 kg/MMBtu, 3*10⁻³ kg/MMBtu, and 6*10⁻⁴ kg/MMBtu, respectively, from 40 CFR 98, Tables C-1 and C-2 for distillate fuel oil No. 2. A diesel fuel oil to ammonium nitrate ratio of 9% and a diesel heating value of 19,300 Btu/pound of diesel fuel were used to express the CO₂, CH₄, and N₂O emission factors in terms of lb/ton of ANFO.



Appendix B

EMISSION REDUCTION ADJUSTMENTS



Appendix B

EMISSION REDUCTION ADJUSTMENTS FOR HARMONY GROVE VILLAGE SOUTH PROJECT

Methodology for Calculating Reduction Credits for the Project with Design Features

Transportation-related emissions reductions would be achieved through mandatory regulations applicable to all vehicle emissions within the state and are not attributable to specific GHG reduction features of the Project. Energy-related emissions reductions would be achieved partly through state regulations, goals, and policies.

As summarized in Table B-1, reduction credits are based on the CARB Scoping Plan reductions for sector-specific activity. For example, Pavley II reductions counted towards the 2020 target is 4 MMT CO₂e and projected 2020 unmitigated transportation-related emissions is 168.2 MMT CO₂e, therefore the reduction is 2.38 percent (4 MMT CO₂e/168.2 MMT CO₂e). This percentage reduction can be applied to the Project's transportation emissions.

Table B-1 SCOPING PLAN GHG EMISSION REDUCTIONS (ANNUAL MMTCO₂e)				
Statewide Land Use-Adjusted 2020 GHG Emissions Inventory¹		AB 32 Scoping Plan GHG Emission Reductions²		Percent Reduction
Sector	Emissions	Measure	Emissions Reduction	
Transportation	168.2	Pavley II	4.0	2.38

Source: CARB 2014

¹ From CARB's 2020 BAU Forecast

² From CARB's Greenhouse Gas Reductions from Ongoing, Adopted and Foreseeable Scoping Plan Measures

Methodology for Calculating Unmitigated and Mitigated Mobile Emissions

The County of San Diego allows the Project to apply GHG reduction credits for Pavley II towards the Project. Therefore, adjustments were made to the CalEEMod model outputs to account for the allowable reduction as shown in Table E-2.

Table B-2
UNCORRECTED AND CORRECTED CALEEMOD OUTPUTS FOR
PROJECT EMISSIONS - MOBILE
(ANNUAL MT CO₂e)

Source	Project Emissions (uncorrected)	Project Emissions (corrected)¹
Mobile Emissions	4,171.77	4,072.48

Notes:

All model results include built in emission reductions for Pavley I regulations (model default).

¹ Includes reduction of 2.38% for Pavely II regulations



Appendix C


AVERAGE TRIP LENGTH ANALYSIS



MEMORANDUM

To: David Kovach
Kovach Companies

Date: June 8, 2016

From: Cara Hilgesen 
LLG, Engineers

LLG Ref: 3-14-2314

Subject: Harmony Grove Village South Traffic Study – Average Trip Length

Linscott, Law & Greenspan, Engineers (LLG) has prepared this memorandum for the Harmony Grove Village South Draft EIR. The Project proposes to develop 453 DU on 111 acres. The average trip length (ATL) in miles per dwelling unit is requested for the environmental Greenhouse Gas Report for compliance with the County's May 2016 recommendations for assessing greenhouse gas emission impacts in the interim period before the revised Climate Action Plan is approved.

The *SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002 provides standard ATLs for various land use types. The standard residential trip length is documented at 7.9 miles. This number represents an estimated average of all residential types (single-family, multi-family, etc.) that was computed from several data sources, some of which were in urban areas and some in rural areas ultimately arriving at an industry average for this land use type. However, the underlying source for SANDAG's 7.9 mile trip length is unknown.

The Project is located within close proximity to an abundant amount of employment opportunities in Escondido and San Marcos, is close to retail shopping areas, and has schools nearby. Because of its proximity to these amenities, a Project-specific analysis was conducted to determine the ATL for the Project site.

In order to arrive at the Project-specific ATL, LLG worked with SANDAG to utilize the SANDAG 2050 Regional Transportation Plan Series 12 Forecast Model. The model assumed existing land use and network conditions (i.e. no Citracado Parkway extension from Andreasen Drive to Harmony Grove Village Parkway). The Project area Traffic Analysis Zone (TAZ) was updated to include the 453 residential units.

Once the model assumptions were validated, a site-specific SANDAG model run was conducted for the Project TAZ. The results of model run are based on Project access locations, characteristics of the roadway system, and the location of residential and employment opportunities in the surrounding area. The reviewed model run provided data disaggregated into two categories: 1) *Vehicle Miles Traveled* and 2) *Average Daily Project Traffic Volumes*. A review of the data output was completed and professional engineering adjustments were made. These two data categories were then used together to calculate ATL.

The total VMT was divided by the Project ADT to arrive at a rate of **7.88 miles per vehicle trip**.

LINSCOTT
LAW &
GREENSPAN

engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law &
Greenspan, Engineers

4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills



Mr. Kovach
6/8/16
Page 2



The data from the model runs are included as *Attachment A* to this memo.

Please call us if you have any questions. Thank you.

cc: File
Attachments: A. SANDAG Series 12 Traffic Model Data

ATTACHMENT A
SANDAG SERIES 12 TRAFFIC MODEL DATA

Q1	ADJUSTED	
	VMT1	PCT
3549	955	100%
1952	1153	55%
1952	84	55%
1562	281	44%
1562	266	44%
1562	131	44%
1384	585	39%
1278	181	36%
1242	83	35%
1207	520	34%
1207	325	34%
1207	68	34%
1207	327	34%
1207	66	34%
1207	392	34%
1207	131	34%
1207	322	34%
1207	180	34%
1171	72	33%
1171	91	33%
1171	32	33%
1171	17	33%
923	193	26%
212	352	6%
212	83	6%
192	153	5%
192	69	5%
182	249	5%
172	146	5%
172	36	5%
172	22	5%
605	36	17%
605	17	17%
603	270	17%
603	44	17%
603	20	17%
603	58	17%
568	58	16%
460	14	13%
460	7	13%
568	133	16%
568	60	16%
121	66	3%
121	22	3%
121	18	3%

Q1	ADJUSTED	
	VMT1	PCT
443	6	12%
428	104	12%
428	48	12%
428	24	12%
428	18	12%
423	71	12%
423	42	12%
497	76	14%
497	37	14%
497	210	14%
532	107	15%
532	37	15%
121	50	3%
389	55	11%
388	62	11%
497	19	14%
426	84	12%
357	37	10%
357	29	10%
355	89	10%
349	66	10%
349	27	10%
341	31	10%
339	38	10%
339	37	10%
319	36	9%
319	11	9%
91	17	3%
81	14	2%
294	106	8%
294	60	8%
294	40	8%
294	28	8%
294	26	8%
81	5	2%
294	17	8%
293	39	8%
285	106	8%
285	81	8%
285	52	8%
285	20	8%
285	13	8%
284	22	8%
281	209	8%
281	23	8%
280	72	8%

Q1	ADJUSTED	
	VMT1	PCT
280	36	8%
279	33	8%
278	85	8%
278	53	8%
275	27	8%
247	15	7%
71	4	2%
71	11	2%
71	5	2%
71	11	2%
71	5	2%
224	35	6%
224	29	6%
224	16	6%
224	12	6%
224	3	6%
223	32	6%
223	28	6%
223	12	6%
223	5	6%
221	84	6%
221	33	6%
221	20	6%
221	20	6%
221	11	6%
219	42	6%
219	12	6%
61	11	2%
217	24	6%
61	6	2%
61	5	2%
61	5	2%
212	28	6%
211	113	6%
211	82	6%
211	71	6%
211	27	6%
209	66	6%
209	11	6%
200	67	6%
200	42	6%
195	41	6%
195	25	6%
190	24	5%
189	54	5%
189	24	5%

Q1	ADJUSTED	
	VMT1	PCT
188	118	5%
186	125	5%
186	111	5%
186	98	5%
186	83	5%
186	57	5%
180	40	5%
178	76	5%
175	11	5%
170	169	5%
170	72	5%
170	51	5%
170	46	5%
170	40	5%
170	29	5%
170	24	5%
168	9	5%
165	45	5%
162	49	5%
161	59	5%
160	192	5%
160	48	5%
160	30	5%
159	87	4%
159	48	4%
159	13	4%
156	75	4%
156	72	4%
155	72	4%
154	50	4%
154	37	4%
154	26	4%
153	25	4%
151	23	4%
150	141	4%
150	114	4%
150	49	4%
150	24	4%
150	15	4%
146	49	4%
146	31	4%
146	28	4%
146	20	4%
146	16	4%
146	15	4%
145	45	4%

Q1	ADJUSTED	
	VMT1	PCT
	145	27 4%
	144	77 4%
	144	56 4%
	142	181 4%
	142	72 4%
	141	35 4%
	141	27 4%
	141	21 4%
	141	20 4%
	140	53 4%
	140	32 4%
	140	31 4%
	140	13 4%
	139	18 4%
	139	9 4%
	139	8 4%
	136	51 4%
	136	42 4%
	136	18 4%
	136	7 4%
	132	35 4%
	132	22 4%
	131	65 4%
	131	37 4%
	131	30 4%
	130	72 4%
	130	67 4%
	130	64 4%
	130	59 4%
	128	9 4%
	127	26 4%
	127	24 4%
	126	41 4%
	126	14 4%
	126	10 4%
	126	9 4%
	126	7 4%
	124	42 4%
	124	30 4%
	124	27 4%
	124	19 4%
	124	12 4%
	122	69 3%
	121	106 3%
	121	5 3%
	120	29 3%

Q1	ADJUSTED	
	VMT1	PCT
	120	9 3%
	120	5 3%
	117	85 3%
	116	89 3%
	116	54 3%
	116	21 3%
	115	7 3%
	114	70 3%
	114	58 3%
	114	15 3%
	114	11 3%
	113	45 3%
	111	37 3%
	111	18 3%
	111	13 3%
	111	13 3%
	111	10 3%
	111	8 3%
	111	6 3%
	110	28 3%
	110	16 3%
	109	39 3%
	109	36 3%
	109	36 3%
	109	34 3%
	109	14 3%
	108	57 3%
	108	53 3%
	108	4 3%
	108	3 3%
	107	47 3%
	106	23 3%
	106	22 3%
	106	14 3%
	106	13 3%
	105	5 3%
	103	47 3%
	103	42 3%
	103	41 3%
	102	23 3%
	102	20 3%
	101	5 3%
	100	11 3%
	99	173 3%
	99	56 3%
	99	43 3%

Q1	ADJUSTED	
	VMT1	PCT
	99	28 3%
	99	19 3%
	98	23 3%
	98	16 3%
	97	71 3%
	97	55 3%
	97	38 3%
	97	31 3%
	97	31 3%
	97	30 3%
	97	27 3%
	97	22 3%
	97	21 3%
	97	20 3%
	97	20 3%
	97	16 3%
	97	14 3%
	97	10 3%
	97	7 3%
	97	6 3%
	96	40 3%
	96	4 3%
	95	59 3%
	95	31 3%
	95	30 3%
	95	29 3%
	95	26 3%
	95	19 3%
	95	17 3%
	95	7 3%
	95	5 3%
	95	4 3%
	94	73 3%
	94	48 3%
	92	66 3%
	92	24 3%
	92	20 3%
	89	35 3%
	86	30 2%
	86	28 2%
	85	7 2%
	84	77 2%
	84	41 2%
	84	8 2%
	83	37 2%
	83	37 2%

Q1	ADJUSTED	
	VMT1	PCT
	83	24 2%
	83	20 2%
	83	18 2%
	83	10 2%
	82	48 2%
	81	10 2%
	80	36 2%
	80	36 2%
	80	14 2%
	79	73 2%
	79	35 2%
	79	5 2%
	79	4 2%
	78	32 2%
	78	32 2%
	78	30 2%
	78	28 2%
	78	20 2%
	77	43 2%
	77	32 2%
	77	25 2%
	75	18 2%
	75	10 2%
	74	47 2%
	74	43 2%
	73	36 2%
	73	7 2%
	73	6 2%
	73	6 2%
	73	4 2%
	73	4 2%
	72	33 2%
	72	12 2%
	72	11 2%
	72	6 2%
	72	2 2%
	71	34 2%
	71	13 2%
	70	26 2%
	70	24 2%
	70	21 2%
	70	15 2%
	70	6 2%
	20	1 1%
	69	8 2%
	69	6 2%

Q1	ADJUSTED	
	VMT1	PCT
	68	10 2%
	68	3 2%
	67	26 2%
	67	19 2%
	67	9 2%
	67	9 2%
	67	8 2%
	67	6 2%
	67	5 2%
	67	5 2%
	67	4 2%
	67	3 2%
	67	3 2%
	67	3 2%
	67	2 2%
	66	15 2%
	66	3 2%
	65	44 2%
	65	6 2%
	63	178 2%
	63	28 2%
	63	8 2%
	63	8 2%
	63	7 2%
	63	5 2%
	62	31 2%
	62	19 2%
	62	8 2%
	62	8 2%
	62	5 2%
	61	25 2%
	61	21 2%
	61	14 2%
	61	13 2%
	61	12 2%
	61	11 2%
	61	10 2%
	61	8 2%
	61	4 2%
	60	12 2%
	60	7 2%
	58	61 2%
	58	49 2%
	58	44 2%
	58	21 2%
	58	18 2%

Q1	ADJUSTED	
	VMT1	PCT
	58	18 2%
	58	14 2%
	58	11 2%
	58	10 2%
	58	8 2%
	58	6 2%
	57	25 2%
	57	15 2%
	57	10 2%
	57	8 2%
	56	19 2%
	56	5 2%
	56	4 2%
	56	1 2%
	55	21 2%
	55	11 2%
	55	9 2%
	55	7 2%
	55	5 2%
	55	4 2%
	55	3 2%
	55	3 2%
	54	51 2%
	54	28 2%
	54	2 2%
	54	2 2%
	54	1 2%
	53	54 1%
	53	9 1%
	52	15 1%
	52	14 1%
	52	8 1%
	52	5 1%
	52	3 1%
	51	9 1%
	51	5 1%
	50	8 1%
	50	5 1%
	49	43 1%
	49	24 1%
	49	19 1%
	49	16 1%
	49	11 1%
	49	3 1%
	48	19 1%
	48	7 1%

Q1	ADJUSTED	
	VMT1	PCT
	48	6 1%
	48	5 1%
	48	4 1%
	48	2 1%
	48	1 1%
	47	23 1%
	47	20 1%
	47	20 1%
	47	5 1%
	47	4 1%
	47	4 1%
	46	56 1%
	46	49 1%
	46	44 1%
	46	34 1%
	46	25 1%
	46	23 1%
	46	22 1%
	46	21 1%
	46	19 1%
	46	14 1%
	46	9 1%
	46	7 1%
	45	55 1%
	45	50 1%
	45	38 1%
	45	35 1%
	45	21 1%
	45	20 1%
	45	12 1%
	45	10 1%
	45	10 1%
	45	8 1%
	45	6 1%
	45	3 1%
	45	3 1%
	45	2 1%
	45	2 1%
	45	1 1%
	45	1 1%
	44	32 1%
	44	31 1%
	44	30 1%
	44	24 1%
	44	23 1%
	44	17 1%

Q1	ADJUSTED	
	VMT1	PCT
	44	15 1%
	44	14 1%
	44	11 1%
	44	11 1%
	44	10 1%
	44	10 1%
	44	9 1%
	44	8 1%
	44	7 1%
	44	7 1%
	44	7 1%
	44	7 1%
	44	4 1%
	44	3 1%
	44	2 1%
	44	1 1%
	44	1 1%
	43	149 1%
	43	30 1%
	43	15 1%
	43	11 1%
	43	8 1%
	43	6 1%
	43	1 1%
	42	144 1%
	42	64 1%
	42	55 1%
	42	29 1%
	42	24 1%
	42	13 1%
	42	9 1%
	42	8 1%
	42	4 1%
	42	4 1%
	42	3 1%
	42	2 1%
	42	2 1%
	42	0 1%
	41	78 1%
	41	73 1%
	41	53 1%
	41	30 1%
	41	28 1%
	41	19 1%
	41	13 1%
	41	9 1%

Q1	ADJUSTED	
	VMT1	PCT
	41	8 1%
	41	6 1%
	41	6 1%
	41	4 1%
	41	4 1%
	41	4 1%
	41	4 1%
	41	4 1%
	41	3 1%
	40	28 1%
	40	24 1%
	40	20 1%
	40	20 1%
	40	10 1%
	40	4 1%
	40	4 1%
	40	4 1%
	40	4 1%
	40	2 1%
	40	2 1%
	40	2 1%
	39	91 1%
	39	66 1%
	39	35 1%
	39	27 1%
	39	26 1%
	39	16 1%
	39	13 1%
	39	10 1%
	39	10 1%
	39	7 1%
	39	7 1%
	39	7 1%
	39	6 1%
	39	4 1%
	39	4 1%
	39	1 1%
	38	97 1%
	38	24 1%
	38	21 1%
	38	19 1%
	38	16 1%
	38	16 1%
	38	16 1%
	38	13 1%

Q1	ADJUSTED	
	VMT1	PCT
	38	13 1%
	38	12 1%
	38	11 1%
	38	10 1%
	38	8 1%
	38	8 1%
	38	7 1%
	38	7 1%
	38	7 1%
	38	7 1%
	38	3 1%
	38	3 1%
	38	2 1%
	38	2 1%
	38	1 1%
	37	31 1%
	37	27 1%
	37	20 1%
	37	20 1%
	37	13 1%
	37	10 1%
	37	9 1%
	37	7 1%
	37	7 1%
	37	7 1%
	37	5 1%
	37	4 1%
	37	4 1%
	37	3 1%
	36	38 1%
	36	32 1%
	36	28 1%
	36	16 1%
	36	6 1%
	36	4 1%
	36	3 1%
	36	2 1%
	36	2 1%
	36	2 1%
	35	22 1%
	35	11 1%
	35	11 1%
	35	10 1%
	35	8 1%
	35	8 1%
	35	7 1%

Q1	ADJUSTED	
	VMT1	PCT
	35	6 1%
	35	5 1%
	35	5 1%
	35	4 1%
	35	4 1%
	35	4 1%
	35	3 1%
	35	3 1%
	35	3 1%
	35	3 1%
	35	3 1%
	35	1 1%
	34	62 1%
	34	44 1%
	34	34 1%
	34	34 1%
	34	21 1%
	34	17 1%
	34	17 1%
	34	13 1%
	34	13 1%
	34	11 1%
	34	11 1%
	34	9 1%
	33	88 1%
	33	77 1%
	33	35 1%
	33	32 1%
	33	24 1%
	33	24 1%
	33	22 1%
	33	22 1%
	33	21 1%
	33	21 1%
	33	18 1%
	33	17 1%
	33	13 1%
	33	12 1%
	33	8 1%
	33	8 1%
	33	7 1%
	33	7 1%
	33	7 1%
	33	7 1%
	33	5 1%
	33	5 1%

Q1	ADJUSTED	
	VMT1	PCT
	33	4 1%
	33	4 1%
	33	3 1%
	33	3 1%
	33	3 1%
	33	3 1%
	33	2 1%
	33	1 1%
	32	71 1%
	32	60 1%
	32	41 1%
	32	21 1%
	32	18 1%
	32	17 1%
	32	16 1%
	32	15 1%
	32	14 1%
	32	13 1%
	32	12 1%
	32	11 1%
	32	11 1%
	32	10 1%
	32	10 1%
	32	8 1%
	32	7 1%
	32	7 1%
	32	7 1%
	32	7 1%
	32	6 1%
	32	6 1%
	32	5 1%
	32	5 1%
	32	4 1%
	32	3 1%
	32	3 1%
	32	3 1%
	32	1 1%
	32	1 1%
	31	52 1%
	31	42 1%
	31	24 1%
	31	10 1%
	31	10 1%
	31	7 1%
	31	6 1%
	31	3 1%

Q1	ADJUSTED	
	VMT1	PCT
	31	2 1%
	30	82 1%
	30	20 1%
	30	20 1%
	30	19 1%
	30	17 1%
	30	13 1%
	30	11 1%
	30	9 1%
	30	9 1%
	30	4 1%
	30	4 1%
	30	4 1%
	30	3 1%
	30	3 1%
	30	3 1%
	30	3 1%
	30	2 1%
	30	2 1%
	30	2 1%
	30	2 1%
	30	1 1%
	29	51 1%
	29	39 1%
	29	14 1%
	29	14 1%
	29	14 1%
	29	12 1%
	29	10 1%
	29	10 1%
	29	7 1%
	29	7 1%
	29	6 1%
	29	5 1%
	29	5 1%
	29	4 1%
	29	3 1%
	29	3 1%
	29	1 1%
	29	1 1%
	28	30 1%
	28	15 1%
	28	12 1%
	28	8 1%
	28	8 1%
	28	7 1%

Q1	ADJUSTED	
	VMT1	PCT
	28	6 1%
	28	6 1%
	28	5 1%
	28	4 1%
	28	3 1%
	28	3 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	2 1%
	28	1 1%
	28	1 1%
	28	1 1%
	27	23 1%
	27	16 1%
	27	14 1%
	27	13 1%
	27	9 1%
	27	8 1%
	27	8 1%
	27	6 1%
	27	6 1%
	27	6 1%
	27	4 1%
	27	4 1%
	27	4 1%
	27	3 1%
	27	3 1%
	27	2 1%
	27	2 1%
	27	2 1%
	27	2 1%
	26	49 1%
	26	23 1%
	26	16 1%
	26	12 1%
	26	11 1%
	26	9 1%
	26	9 1%
	26	9 1%
	26	7 1%
	26	7 1%
	26	4 1%

Q1	ADJUSTED	
	VMT1	PCT
	26	4 1%
	26	1 1%
	26	1 1%
	25	19 1%
	25	13 1%
	25	9 1%
	25	8 1%
	25	7 1%
	25	5 1%
	25	3 1%
	25	3 1%
	25	2 1%
	25	2 1%
	25	1 1%
	25	1 1%
	24	36 1%
	24	26 1%
	24	15 1%
	24	14 1%
	24	11 1%
	24	9 1%
	24	9 1%
	24	9 1%
	24	8 1%
	24	7 1%
	24	7 1%
	24	7 1%
	24	6 1%
	24	6 1%
	24	6 1%
	24	6 1%
	24	6 1%
	24	5 1%
	24	5 1%
	24	5 1%
	24	5 1%
	24	5 1%
	24	4 1%
	24	4 1%
	24	3 1%
	24	3 1%
	24	3 1%
	24	2 1%
	24	2 1%
	24	2 1%
	24	2 1%

Q1	ADJUSTED	
	VMT1	PCT
	24	2 1%
	24	2 1%
	24	1 1%
	24	1 1%
	24	1 1%
	23	24 1%
	23	8 1%
	23	8 1%
	23	8 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	6 1%
	23	3 1%
	23	3 1%
	23	2 1%
	23	2 1%
	23	2 1%
	23	2 1%
	23	2 1%
	23	2 1%
	23	1 1%
	23	1 1%
	23	1 1%
	22	12 1%
	22	9 1%
	22	8 1%
	22	7 1%
	22	6 1%
	22	6 1%
	22	5 1%
	22	5 1%
	22	5 1%
	22	5 1%
	22	5 1%
	22	5 1%
	22	5 1%
	22	3 1%
	22	3 1%
	22	2 1%
	22	2 1%
	22	2 1%
	22	2 1%

Q1	ADJUSTED	
	VMT1	PCT
	22	2 1%
	22	1 1%
	22	1 1%
	22	1 1%
	22	1 1%
	21	35 1%
	21	8 1%
	21	6 1%
	21	6 1%
	21	5 1%
	21	5 1%
	21	5 1%
	21	4 1%
	21	3 1%
	21	3 1%
	21	3 1%
	21	3 1%
	21	3 1%
	21	2 1%
	21	2 1%
	21	2 1%
	21	1 1%
	21	1 1%
	21	1 1%
	20	31 1%
	20	17 1%
	20	9 1%
	20	7 1%
	20	7 1%
	20	5 1%
	20	4 1%
	20	4 1%
	20	3 1%
	20	3 1%
	20	3 1%
	20	3 1%
	20	3 1%
	20	3 1%
	20	2 1%
	20	2 1%
	20	2 1%
	20	2 1%
	20	2 1%
	20	2 1%
	20	2 1%
	20	2 1%

Q1	ADJUSTED	
	VMT1	PCT
	20	2 1%
	20	2 1%
	20	1 1%
	20	1 1%
	20	1 1%
	20	0 1%
	19	6 1%
	19	5 1%
	19	5 1%
	19	4 1%
	19	4 1%
	19	4 1%
	19	4 1%
	19	3 1%
	19	3 1%
	19	3 1%
	19	3 1%
	19	3 1%
	19	3 1%
	19	2 1%
	19	2 1%
	19	2 1%
	19	2 1%
	19	2 1%
	19	2 1%
	19	2 1%
	19	1 1%
	19	1 1%
	19	1 1%
	19	1 1%
	19	1 1%
	19	0 1%
	19	0 1%
	18	7 1%
	18	5 1%
	18	5 1%
	18	4 1%
	18	4 1%
	18	4 1%
	18	4 1%
	18	3 1%
	18	3 1%
	18	3 1%
	18	3 1%
	18	3 1%

Q1	ADJUSTED	
	VMT1	PCT
	18	3 1%
	18	3 1%
	18	3 1%
	18	2 1%
	18	2 1%
	18	2 1%
	18	2 1%
	18	2 1%
	18	2 1%
	18	2 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%
	18	1 1%

VMT	27975
ADT	3549
ATL	7.88



Appendix D

EFFICIENCY METRIC CALCULATIONS



California Greenhouse Gas Inventory for 1990 — by Sector and Activity (Land Use-driven sectors only)
million metric tons of CO₂ equivalent - (based upon IPCC Second Assessment Report's Global Warming Potentials)

1990

Transportation	
On Road	
Passenger Cars	63.77
Light Duty Trucks	44.75
Motorcycles	0.43
Heavy Duty Trucks	29.03
Freight	0.02
Electricity Generation In-State)	
CHP: Commercial	0.70
Merchant Owned	2.33
Transmission and Distribution	1.56
Utility Owned	29.92
Electricity Generation In-State)	
Specified Imports	29.61
Transmission and Distribution	1.02
Unspecified Imports	30.96
Commercial	
CHP: Commercial	0.40
Communication	0.07
Domestic Utilities	0.34
Education	1.42
Food Services	1.89
Healthcare	1.32
Hotels	0.67
Not Specified Commercial	5.58
Offices	1.46
Retail & Wholesale	0.68
Transportation Services	0.03
Residential	
Household Use	29.66
Industrial	
Landfills	6.26
Wastewater Treatment	
Domestic Wastewater	2.83
Total Emissions	286.70

Service Population Threshold - 2020 and 2021

	2020	2021
Population	40,619,346	40,965,875
Employment	18,511,200	18,609,900
Service Population	59,130,546	59,575,775
Emissions (MMT)	286.70	272.08

MT/SP	4.9	4.6
-------	-----	-----

2021 Emissions based on an annual 5.2% reduction from 2020 (ARB 2015)

Notes:

MMT = million metric tons; MT = metric tons; SP = service population

Source:

California Department of Finance

Demographic Research Unit

Report P-2

State and County Population Projections by Race/Ethnicity and Age (5-year groups)

2010 through 2060 (as of July 1)

Published 12/15/2014

California Department of Finance Employment Development Department

Industry Employment Projections Labor Market Information Division 2010-2020

Published 5/23/2012

Industry Employment Projections Labor Market Information Division 2012-2022

Published 9/19/2014

Employment data for interim years is estimated based on proportionality with population trends based on historical data.

2030 Target Scoping Plan Workshop Slides. (October 1, 2015).

Available: http://www.arb.ca.gov/cc/scopingplan/meetings/10_1_15slides/2015slides.pdf

California Greenhouse Gas Inventory for 1990 — by Sector and Activity
million metric tons of CO₂ equivalent - (based upon IPCC Second Assessment Report's Global Warming Potentials)

1990

Transportation	
On Road	137.99
Passenger Cars	63.77
Light Duty Trucks	44.75
Motorcycles	0.43
Heavy Duty Trucks	29.03
Freight	0.02
Ships & Commercial Boats	2.21
Aviation (Intrastate)	5.13
Rail	2.33
Unspecified	3.01
Electricity Generation In-State)	
CHP: Commercial	0.7
CHP: Industrial	14.54
Merchant Owned	2.33
Transmission and Distribution	1.56
Utility Owned	29.92
Electricity Generation In-State)	
Specified Imports	29.61
Transmission and Distribution	1.02
Unspecified Imports	30.96
Commercial	
CHP: Commercial	0.401
Communication	0.07
Domestic Utilities	0.339
Education	1.417
Food Services	1.893
Healthcare	1.323
Hotels	0.671
National Security	0.564
Not Specified Commercial	5.577
Offices	1.456
Retail & Wholesale	0.683
Transportation Services	0.034
Residential	
Household Use	29.657
Industrial	
CHP: Industrial	9.7
Flaring	0.15
Landfills	6.256
Manufacturing	31.98
Mining	0.03
Not Specified Industrial	2.63
Oil & Gas Extraction	14.65
Petroleum Marketing	0.02
Petroleum Refining	32.82
Pipelines	1.63
Wastewater Treatment	
Domestic Wastewater	2.833
Industrial Wastewater	0.333
Agriculture & Forestry	
Ag Energy Use	4.505
Ag Residue Burning	0.124
Ag Soil Management	6.54
Enteric Fermentation	6.668
Forest and Range Management	0.19
Histosol Cultivation	0.181
Manure Management	5
Net CO₂ Flux	-6.69
Rice Cultivation	0.41
Not Specified	
Not Specified	1.267
Total Emissions	

= Included in land use inventory

= Excluded from land use inventory