GLOBAL CLIMATE CHANGE

Lone Oak Ranch
Residential Development

Lead Agency:

County of San Diego
Planning and Development Services
Contact: Michael Johnson
5510 Overland Avenue, Suite 110
San Diego, CA 92123
(858) 694-3429

Prepared By:

Jeremy Louden
Ldn Consulting, Inc.
446 Crestcourt Lane
Fallbrook, California 92028

Project For:

Marker Lone Oak, LLC
427 S. Cedros Avenue, Suite 201
Solana Beach, CA 92075

March 23, 2015

TABLE OF CONTENTS

List of Figures

List of Tables

Appendix

LIST OF ACRONYMS

Assembly Bill 32 (AB32)

Business as Usual (BAU)

California Air Pollution Control Officers Association's (CAPCOA)

California Air Resource Board (CARB)

California Climate Action Registry General Reporting Protocol Version 3.1 (CCARGRPV3.1)

California Energy Commission (CEC)

California Environmental Quality Act (CEQA)

Carbon Dioxide (CO2)

Cubic Yards (CY)

Environmental Protection Agency (EPA)

Green House Gas (GHG)

International Residential Code (IRC)

Low Carbon Fuel Standard (LCFS)

Methane (CH4)

Nitrous Oxide (N2O)

San Diego Air Basin (SDAB)

San Diego Air Pollution Control District (SDAPCD)

Senate Bill 97 (SB97)

Vehicle Miles Traveled (VMT)

EXECUTIVE SUMMARY

This analysis has been completed in order to quantify Greenhouse Gas (GHG) emissions from the project and was prepared according to guidelines established within the California Global Warming Solutions Act of 2006 – Assembly Bill 32 (AB32), Senate Bill 97 (SB97), California Environmental Quality Act (CEQA) and the County of San Diego's Guidelines. Greenhouse Gasses analyzed in this study are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). To simplify greenhouse gas calculations, both CH_4 and N_2O are converted to equivalent amounts of CO_2 and are identified as CO_2e. The proposed Project site is located within the community near Vista, within the northern portion of San Diego County. The Project proposes to construct 26 single family residential dwelling units which would be completed in October of 2015.

The proposed project will emit GHGs directly through the burning of carbon-based fuels such as gasoline and natural gas as well as indirectly through usage of electricity, water and from the anaerobic bacterial breakdown of organic solid waste. The proposed project would generate approximately 504.45 Metric Tons of CO_2e each year which includes operations and construction emissions amortized over 20 years. Given this, the proposed project would not exceed the 900 Metric Ton per year screening criteria used by the County of San Diego. Therefore, the project would not require further design features to comply with the County of San Diego's GHG policies.

1.0 INTRODUCTION

1.1 Purpose of this Study

The purpose of this Green House Gas Assessment (GHG) is to show conformance to the California Global Warming Solutions Act of 2006 – Assembly Bill 32 (AB32) and Senate Bill 97 (SB97). AB32 requires that by 2020 the state's greenhouse gas emissions be reduced to 1990 levels and SB97 a "companion" bill directed amendments to the California Environmental Quality Act (CEQA) statute to specifically establish that GHG emissions and their impacts are appropriate subjects for CEQA analysis. Should impacts be determined, the intent of this study would be to recommend suitable design measures to bring the Project to a level considered less than significant.

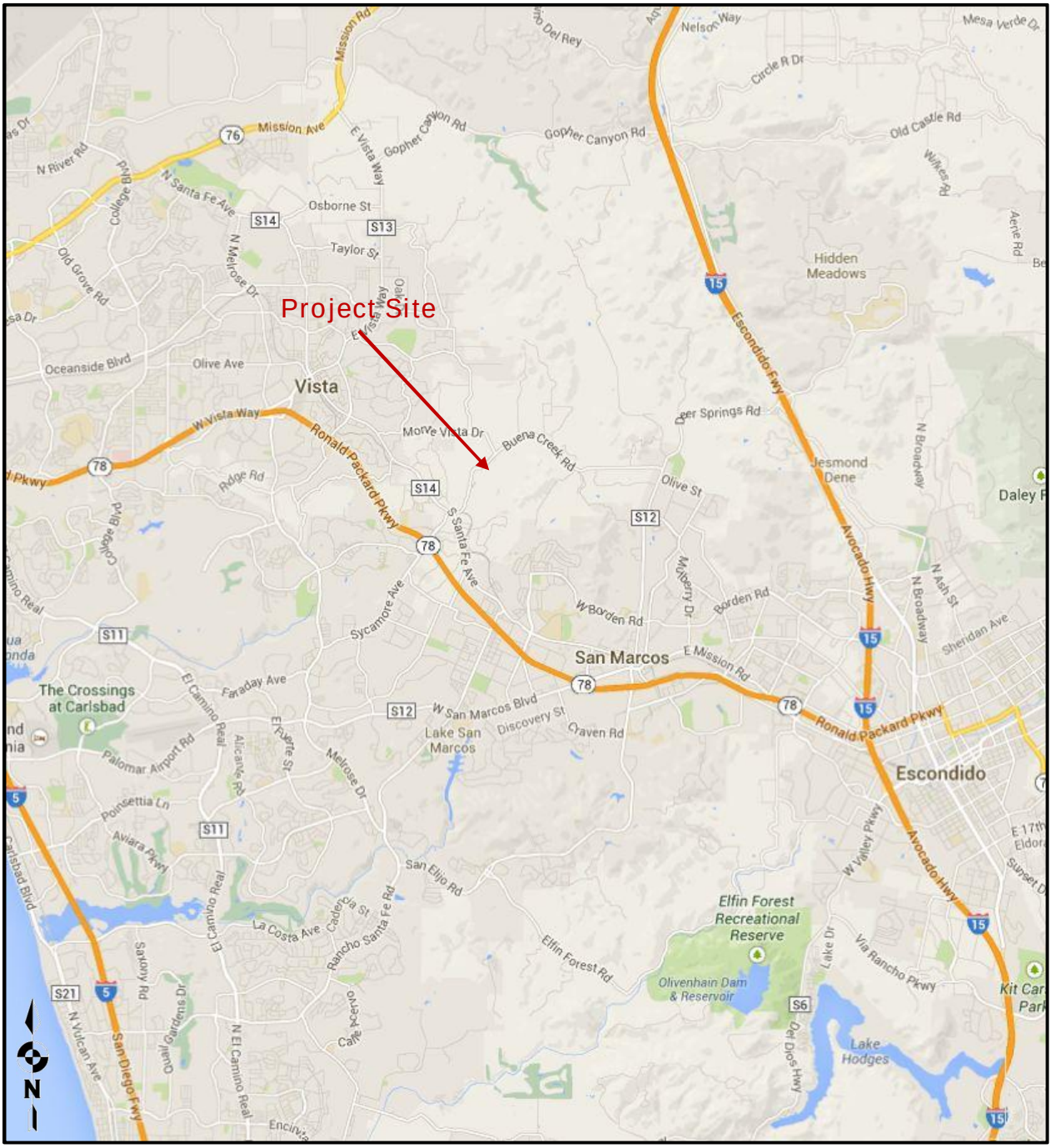
1.2 Project Location

The proposed development is located in an unincorporated area near the City of Vista within the County of San Diego. The Project is located east of Buena Creek Road, South of Cleveland Trail and east of Lone Oak Road. State Route 78 (SR 78) to the south provides regional access to the project site. A general project vicinity map is shown in Figure 1–A on the following page.

1.3 Project Description

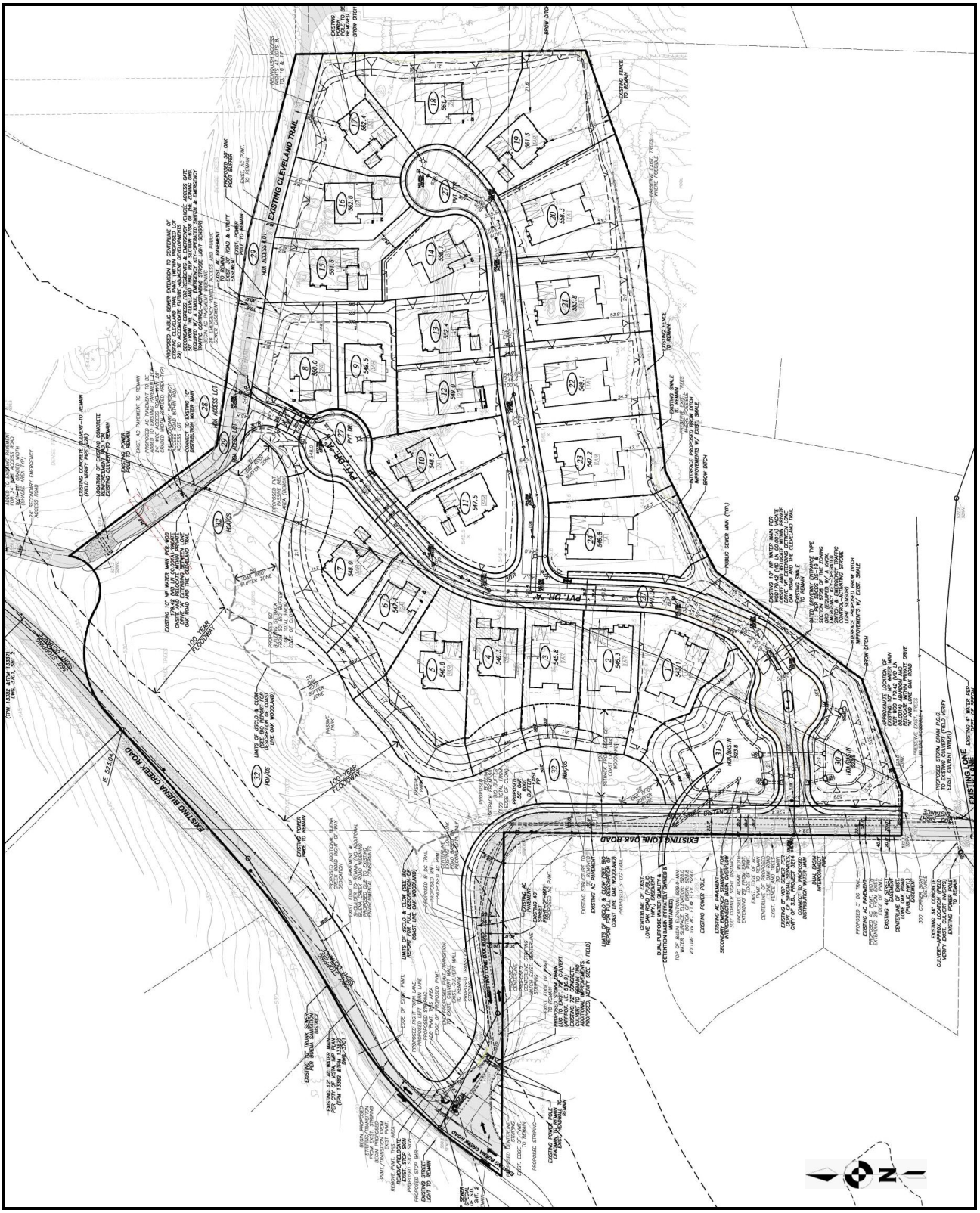
The Lone Oak Ranch site is proposed to be developed with 26 single family residential dwelling units on approximately 13 net acre site. Construction is expected to start in January 2015 and be completed in the fall of 2015. The project earthwork will be balanced onsite.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 2014

Figure 1-B: Project Vicinity Map



Source: Hunsaker and Associates, 2014

2.0 EXISTING ENVIRONMENTAL SETTING

2.1 Understanding Greenhouse Gasses

Greenhouse gases such as water vapor and carbon dioxide are abundant in the earth's atmosphere. These gases are called "Greenhouse Gases" because they absorb and emit thermal infrared radiation which acts like an insulator to the planet. Without these gases, the earth ambient temperature would either be extremely hot during the day or blistering cold at night. However, because these gases can both absorb and emit heat, the earth's temperature does not sway too far in either direction.

Over the years as human activities require the use of burning fossil fuels stored carbon is released into the air in the form of CO_2 and to a much lesser extent CO. Additionally, over the years scientist have measured this rise in Carbon Dioxide and fear that it may be heating the planet too. Additionally, it is thought that other greenhouse gases such as Methane and Nitrous Oxide are to blame.

Greenhouse Gasses of concern as analyzed in this study are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). To simply greenhouse gas calculations, both CH_4 and N_2O can be converted to an equivalent amount of CO_2 or CO_2e. CO_2e is calculated by multiplying the calculated levels of CH_4 and N_2O by a Global Warming Potential (GWP). The U.S. Environmental Protection Agency publishes GWPs for various GHGs and reports that the GWP for CH_4 and N_2O is 21 and 310, respectively.

2.2 Existing Setting

The Project site lies within a somewhat mixed use rural residential area with some commercial activities surrounding the project site. The existing project area has four separate residential facilities onsite with a majority of the site dedicated to agricultural uses. The average elevation of the site ranges between 530 and 580-feet above mean sea level.

2.3 Climate and Meteorology

Climate within the San Diego Air Basin SDAB area varies dramatically over short geographical distances due to size and topography. Most of southern California is dominated by high-pressure systems for much of the year, which keeps the high desert mostly sunny and warm. Typically, during the winter months, the high pressure system drops to the south and brings cooler, moister weather from the north. Prevailing winds are generally flowing in an easterly direction for most of the year however during the autumn and winter, it's common for strong warm dry winds originating in the eastern desert areas to flow in a westerly direction.

Meteorological trends within Vista area generally mild with daytime highs typically ranging between 68ºF in the winter to approximately 83ºF in the summer with August usually being the hottest month. Median temperatures range from approximately 56ºF in the winter to approximately 73ºF in the summer. The average humidity is approximately 63% in the winter and about 74% in the summer (Source: http://www.city-data.com). Vista usually receives approximately 13.24 inches of rain per year with February usually being the wettest month (Source: http://www.weather.com).

3.0 CLIMATE CHANGE REGULATORY ENVIRONMENT

3.1 Regulatory Standards (Assembly Bill 32)

The Global Warming Solutions Act of 2006 (AB 32), requires that by 2020 the state's greenhouse gas emissions be reduced to 1990 levels or roughly a 28.3% reduction. Significance thresholds have not been adopted but are currently being discussed. AB 32 is specific as to when thresholds shall be defined. The pertinent Sections are referenced within Part 4 of AB 32 Titled *Greenhouse Gas Emissions Reductions* are shown below:

Section 38560.5 (b) states:

On or before January 1, 2010, the state board shall adopt regulations to implement the measures identified on the list published pursuant to subdivision (a).

Section 38562 states:

(A) On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit, to become operative beginning on January 1, 2012.

(B) In adopting regulations pursuant to this Section and Part 5 (commencing with Section (38570), to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

1. *Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.*
2. *Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.*
3. *Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this Section receive appropriate credit for early voluntary reductions.*
4. *Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.*
5. *Consider cost-effectiveness of these regulations.*

6. *Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.*
7. *Minimize the administrative burden of implementing and complying with these regulations.*
8. *Minimize leakage.*
9. *Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.*

(C) In furtherance of achieving the statewide greenhouse gas emissions limit, by January 1, 2011, the state board may adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020, inclusive, that the state board determines will achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources.

(D) Any regulation adopted by the state board pursuant to this part or Part 5 (commencing with Section 38570) shall ensure all of the following:

1. *The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.*
2. *For regulations pursuant to Part 5 (commencing with Section 38570), the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.*
3. *If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.*

3.2 Senate Bill No. 375 (SB 375)

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) supports the State's climate action goals to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, ARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPO).

Each of California's MPOs must prepare a "sustainable communities strategy" (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region. ARB must review the adopted SCS to confirm and accept the MPO's determination that the SCS, if implemented, would meet the regional GHG targets. If the combination of measures in the SCS would not meet the regional targets, the MPO must prepare a separate "alternative planning strategy" (APS) to meet the targets (Source: http://www.arb.ca.gov/cc/sb375/sb375.htm).

3.3 Regulatory Standards (Senate Bill 97)

SB 97 requires the Office of Planning and Research (OPR) to prepare and transmit to the Resources Agency, guidelines and directed amendments to the CEQA statute specifically for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions.

3.4 AB 1493 (Pavley Standards)

Assembly Bill 1493 was California's first bill which was approved by the Governor in 2002 and was designed to reduce greenhouse gases within the state of California. It required the State Board do develop and adopt motor vehicle regulations to cost effectively reduce greenhouse gasses by January 1, 2005 and start enforcing them a year later. Furthermore, the state board shall develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles.

AB 1493 regulations are similar to CAFE Standards however are expected to produce a Greenhouse Gas Benefit greater to that of the CAFE Standard and would be expected to double the amount of GHGs saved under CAFE. The Pavley rules or also referred to as California Standards are designed to regulate GHG emissions while the federal standards are aimed at reducing the nation's fuel consumption.

Under Pavley starting with vehicles produced in 2009, manufactures have the flexibility in meeting California standards through a combination of reducing tailpipe emissions of Carbon Dioxide, Nitrous Oxide, Methane and hydrofluorocarbons from vehicle air conditions systems. Furthermore, the California standards are estimated to increase fuel efficiency to 43 miles per gallon by 2020. The 2020 reductions are based on a more stringent emission limit than the current California Standards, Called the Pavley 2 Rule, as set forth in the California Climate Action Plan and committed to by the ARV in its Early Action Measures under AB32.

CARB staff recommends through example the use of more stringent emission reduction beginning in 2017 as well as applying more stringent standards through 2020. The percent reductions will be further discussed in the methodology Section of this report. *(Source: Comparison of Greenhouse Gas Reduction for the United States and Canada under U.S. CAFE Standards and California Air Resources Board Greenhouse Gas Regulations – 2/2008)* otherwise referred to as CARB's Enhanced Technical Assessment on the relationship between CAFE standards and Pavley Standards.

This report utilized a baseline year of 2002 and calculated cumulative baseline equivalent GHG Reductions based on Pavley standards. One conclusion of the study finds that Pavley reductions are as high as 20% from 2002 levels. Also, it should be noted that reductions under Pavley were not assumed from 2002 through 2008.

On June 30, 2009, EPA granted waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. In 2009 Pavley regulations went into effect and become more stringent with time which will require automobile companies to produce vehicles that generate less GHG emissions each year.

3.5 Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 (P.L. 110-140, H.R. 6) is an energy policy law adopted by congress which consists mainly of provisions designed to increase energy efficiency and the availability of renewable energy. The law will require automakers to boost fleet wide gas mileage averages from the current 25 mpg to 35 mpg by 2020. The rule was updated in 2010 which required fleet-wide fuel economy standard to be set at 34.1 miles per gallon by 2016 and affect cars built in 2012 through 2016. Also, in October 2012, the rules were further changed to 54.5 mpg for cars and light-duty trucks by Model Year 2025. This fleet wide average is known as the Corporate Average Fuel Economy (CAFE) standard.

CAFE Standards are similar to requirements developed within AB 1493 regulations however would not reduce greenhouse gas levels as quickly. The United States Environmental Protection Agency (U.S. EPA) denied the state of California from implementing AB 1493.

3.6 Executive Order S-01-07

Executive Order S-01-07 was signed by Governor Arnold Schwarzenegger in January 2007 and is effectively known as the Low Carbon Fuel Standard or LCFS. The executive order seeks to reduce the carbon intensity of California's passenger vehicle fuels by at least 10%

by 2020. The LCFS will require fuel providers in California to ensure that the mix of fuel they sell into the California market meet, on average, a declining standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold.

3.7 California Environmental Quality Act (CEQA) Requirements

As directed by SB 97, the Natural Resources Agency adopted Amendments to Title 14 Division 6 Chapter 3 CEQA Guidelines for greenhouse gas emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010. The pertinent Sections are shown below:

Section 15064.4 - Determining the Significance of Impacts from Greenhouse Gas

(A) The 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:

1. *Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or*
2. *Rely on a qualitative analysis or performance-based standards.*

(B) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

1. *The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
2. *Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
3. *The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

General Questions recommended within the environmental checklist are:

(a) Will the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

(b) Will the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

3.8 ARB Scoping Plan Measures

As directed by SB 97, the Natural Resources Agency adopted Amendments to Title 14 Division 6 Chapter 3 CEQA Guidelines for greenhouse gas emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010. The pertinent Sections are shown below in Table 3.1.

Table 3.1: Adopted Discretionary Measures

Row #	Scoping Plan Measure	Measure #	Page #
1	Ship Electrification at Ports	T-5	C-66
2	Limit High GWP Use in Consumer Products	H-4	C-179
3	Heavy-Duty Vehicle GHG Emission Reduction	T-7	C-73
4	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	C-175
5	SF6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	C-176
6	Reduction of Perfluorocarbons in Semiconductor Manufacturing	H-3	C-177
7	Tire Pressure Program	T-4	C-63
8	Low Carbon Fuel Standard	T-2	C-64
9	Landfill Methane Control Measure	RW-1	C-160

Additionally, as stated in Section 38562-A of AB 32, the state board adopted greenhouse gas emission limits and emission reduction measures on January 1, 2011 and started enforcing them January 1, 2012. Currently, greenhouse gas emission limits for residential project such as the proposed project have not been adopted, however, Section 38562-B-3 encourages projects producing large quantities of GHGs to voluntarily identify greenhouse gas reductions and receive appropriate credit for early voluntary reductions.

3.9 County of San Diego Thresholds of Significance

The County of San Diego has developed a Recommended Approach to Addressing Climate Change in CEQA Documents (San Diego County 2015). The guidelines provide initial screening criteria for projects (i.e., 900 Metric Tons of CO_2e/year), as well as guidance for the determination of significance. Based on the County guidance, project sizes that are estimated to emit more than 900 Metric Tons of GHGs would be required to conduct further GHG analysis and mitigation. The 900 metric ton screening threshold for determining when a GHG analysis is required was chosen based on available guidance from CAPCOA. The County's guidelines for determining significance has been developed from the requirements of AB 32 and addresses the potential cumulative impacts that a project's GHG emissions could have on global climate change.

4.0 METHODOLOGY

4.1 Construction CO_2e Emissions Calculation Methodology

The Project construction dates were estimated based on the proposed construction kickoff in January 2015 with grading and trenching expected to last about three months, underground utilities would be expected to begin just after grading operations and would be expected to last about one month. Once underground utilities are completed, paving would begin which is expected to last no longer than one month as well. Finally building construction would begin in May of 2015 and would be completed roughly 5 months later towards the end of October 2015.

Table 4.1 below shows the expected timeframes for the construction processes for all the project infrastructure, facilities, improvements and residential structures at the proposed project location as well as the expected number of pieces of equipment.

Table 4.1: Expected Construction Equipment

Equipment Identification	Proposed Dates	Construction Days	Quantity
Mass Site Grading	01/05/2015 - 03/01/2015	40	
Excavators			2
Graders			1
Rubber Tired Dozers			2
Scrapers			2
Tractors/Loaders/Backhoes			1
Trenching	3/02/2015 - 3/31/2015	22	
Excavators			2
Tractors/Loaders/Backhoes			2
Paving	04/01/2015-04/30/2015	22	
Pavers			2
Paving Equipment			2
Rollers			2
Tractors/Loaders/Backhoes			1
Building Construction	5/1/2015-10/30/2015	131	
Cranes			1
Forklifts			3
Generator Sets			2
Tractors/Loaders/Backhoes			2
Welders			1
Architectural Coating	6/01/2015- 10/30/2015	110	
This equipment list is based upon equipment inventory within CALLEEMOD 2013.2.2. The quantity and types are based upon assumptions from Projects of similar size and scope in the County of San Diego.			

GHG impacts related to construction will be calculated using the latest CalEEMod 2013.2.2 air quality model which was developed by ENVIRON International Corporation for South Coast Air Quality Management District (SCAQMD). Additionally, CO_2e emissions generated from blasting will be added to the CalEEMod output. CalEEMod incorporates emission factors from the EMFAC2011 model for on-road vehicle emissions and the OFFROAD2011 model for off-road vehicle emissions. Because CO_2 emissions from construction only occur at the beginning of a project, emissions will be averaged over a 20-year period.

4.2 Operational Emissions Calculation Methodology

Once construction is completed the proposed project would generate air quality and GHG emissions from daily operations which would include sources such as Area, Energy, Mobile, Solid waste and Water uses, which are calculated within CalEEMod. Area Sources include usage of fireplaces, consumer products, landscaping and architectural coatings as part of regular maintenance.

Energy sources would be from uses such as electricity and natural gas. Solid waste generated in the form of trash is also considered as decomposition of organic material breaks down to form GHGs. GHGs from water are also indirectly generated through the conveyance of the resource via pumping throughout the state and as necessary for wastewater treatment. Finally the project would also generate GHG through the use of carbon fuel burning vehicles for transportation. The annual CalEEMod inputs are shown in *Attachments A* at the end of this report.

5.0 FINDINGS

5.1 Project Related Construction Emissions

Utilizing the CalEEMod inputs for the model as shown in Table 4.1 above, we find that grading and construction of the project will produce approximately 382.28 Metric Tons of CO_2e over the construction life of the project. Given the fact that the total emissions will ultimately contribute to 2020 cumulative levels, it is acceptable to average the total construction emission over a 20 year period. A summary of the construction emissions is shown in Table 5.1 below.

Table 5.1: Expected Construction Emissions Summary

Year	CO_2
Construction Total (2015)	382.27
Yearly Average (2020)*	19.11 tons/year over 20 years

Expected Construction emissions are based upon CalEEMod assumptions identified in Chapter 4 of this report.
* Total Construction related CO_2 averaged over a 20-year span.
Data is presented in decimal format and may have rounding errors.

5.2 Project Related Operational Emissions/Conclusions

As previously discussed, emissions generated from Area, Energy, Mobile, Solid Waste and Water uses is also calculated within CalEEMod. The program is largely based on default settings which are automatically populated throughout the model based on the imputed land use. Statewide averages for utility emissions were utilized for the calculations throughout the model.

The proposed project will emit approximately 485.34 Metric Tons of CO_2e each year during a typical operational year. The calculated operational emissions are identified in Table 5.2 on the following Page. It should also be noted that emissions generated by this project would further be reduced through indirect measures such as LCFS, Pavley and renewable requirements placed on utility providers within California.

Table 5.2: Expected Operational Emissions Summary MT/Year

Year	Bio-CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Area	26.86	11.58	38.44	0.03	0.00	39.62
Energy	0.00	112.10	112.10	0.00	0.00	112.61
Mobile	0.00	305.80	305.80	0.01	0.00	306.08
Waste	6.16	0.00	6.16	0.36	0.00	13.80
Water	0.54	11.09	11.62	0.06	0.00	13.22
Total Operations						485.34

Expected Construction emissions are based upon CalEEMod modeling assumptions for equipment and durations listed in Table 5.1 above.
Data is presented in decimal format and may have rounding errors.

5.3 Project Cumulative Totals and Conclusion

Cumulatively, the Project's construction and operations will emit approximately 485.34 Metric Tons of CO_2e each year for operations and 19.11 Metric Tons of CO_2e during construction. Combined, the project would produce 504.45 Metric Tons each year. Per guidelines of CAPCOA's 900 Metric Ton per year threshold, the proposed Project would not be required to implement further design features to comply with the County's GHG policies.

6.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the projected CO_2e emissions from the proposed Lone Oak Ranch development project based upon the best available information at the time of preparation. The report was prepared by Jeremy Louden; an approved CEQA Consultant for Air Quality and Greenhouse Gas.

DRAFT

Jeremy Louden, Principal
Ldn Consulting, Inc.
(760) 473-1253
jlouden@ldnconsulting.net

Date April 23, 2015

ATTACHMENT A

CalEEMod 2013.2.2

Loan Oaks Ranch

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	26.00	Dwelling Unit	13.00	46,800.00	74

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	10			**Operational Year**	2016
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project acreage is approximatly 13 acres

Construction Phase - Construction was revised to show worst-case durations

Off-road Equipment -

Off-road Equipment - Reflects estimated worst-case equipment

Off-road Equipment - Reflects estimated worst-case equipment

Off-road Equipment - Reflects estimated worst-case equipment

Off-road Equipment - Reflects estimated worst-case equipment

Trips and VMT - Trenching updated to be consistent with grading,paving,BC and AC

Demolition -

Grading - Site Acres

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	110.00
tblConstructionPhase	NumDays	300.00	131.00
tblConstructionPhase	NumDays	30.00	40.00
tblConstructionPhase	NumDays	20.00	22.00
tblConstructionPhase	PhaseEndDate	4/1/2016	10/30/2015
tblConstructionPhase	PhaseEndDate	2/27/2015	3/1/2015
tblConstructionPhase	PhaseStartDate	10/31/2015	6/1/2015
tblGrading	AcresOfGrading	100.00	13.00
tblLandUse	LotAcreage	8.44	13.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2016

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					
2015	1.2264	4.5616	3.0360	4.1600e-003	0.2603	0.2731	0.5334	0.1365	0.2570	0.3935	0.0000	380.3385	380.3385	0.0924	0.0000	382.2789
Total	**1.2264**	**4.5616**	**3.0360**	**4.1600e-003**	**0.2603**	**0.2731**	**0.5334**	**0.1365**	**0.2570**	**0.3935**	**0.0000**	**380.3385**	**380.3385**	**0.0924**	**0.0000**	**382.2789**

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					
2015	1.2264	4.5616	3.0360	4.1600e-003	0.2603	0.2731	0.5334	0.1365	0.2570	0.3935	0.0000	380.3381	380.3381	0.0924	0.0000	382.2785
Total	**1.2264**	**4.5616**	**3.0360**	**4.1600e-003**	**0.2603**	**0.2731**	**0.5334**	**0.1365**	**0.2570**	**0.3935**	**0.0000**	**380.3381**	**380.3381**	**0.0924**	**0.0000**	**382.2785**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8936	0.0244	2.2055	8.0000e-004		0.2834	0.2834		0.2834	0.2834	26.8569	11.5787	38.4356	0.0251	2.1100e-003	39.6177
Energy	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	112.1043	112.1043	3.5200e-003	1.4000e-003	112.6131
Mobile	0.1728	0.4178	1.8559	3.8600e-003	0.2660	5.2600e-003	0.2712	0.0711	4.8400e-003	0.0760	0.0000	305.8036	305.8036	0.0133	0.0000	306.0824
Waste						0.0000	0.0000		0.0000	0.0000	6.1588	0.0000	6.1588	0.3640	0.0000	13.8022
Water						0.0000	0.0000		0.0000	0.0000	0.5374	11.0862	11.6237	0.0557	1.4000e-003	13.2249
Total	**2.0711**	**0.4827**	**4.0786**	**4.9200e-003**	**0.2660**	**0.2919**	**0.5579**	**0.0711**	**0.2915**	**0.3627**	**33.5531**	**440.5729**	**474.1259**	**0.4615**	**4.9100e-003**	**485.3403**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8936	0.0244	2.2055	8.0000e-004		0.2834	0.2834		0.2834	0.2834	26.8569	11.5787	38.4356	0.0251	2.1100e-003	39.6177
Energy	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	112.1043	112.1043	3.5200e-003	1.4000e-003	112.6131
Mobile	0.1728	0.4178	1.8559	3.8600e-003	0.2660	5.2600e-003	0.2712	0.0711	4.8400e-003	0.0760	0.0000	305.8036	305.8036	0.0133	0.0000	306.0824
Waste						0.0000	0.0000		0.0000	0.0000	6.1588	0.0000	6.1588	0.3640	0.0000	13.8022
Water						0.0000	0.0000		0.0000	0.0000	0.5374	11.0862	11.6237	0.0556	1.3900e-003	13.2240
Total	**2.0711**	**0.4827**	**4.0786**	**4.9200e-003**	**0.2660**	**0.2919**	**0.5579**	**0.0711**	**0.2915**	**0.3627**	**33.5531**	**440.5729**	**474.1259**	**0.4615**	**4.9000e-003**	**485.3394**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.20**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/5/2015	3/1/2015	5	40	
2	Trenching	Trenching	3/2/2015	3/31/2015	5	22	
3	Paving	Paving	4/1/2015	4/30/2015	5	22	
4	Building Construction	Building Construction	5/1/2015	10/30/2015	5	131	
5	Architectural Coating	Architectural Coating	6/1/2015	10/30/2015	5	110	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 13

Acres of Paving: 0

Residential Indoor: 94,770; Residential Outdoor: 31,590; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	2	8.00	162	0.38
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
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
Paving	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
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
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9.00	3.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2015

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					0.2478	0.0000	0.2478	0.1332	0.0000	0.1332	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1538	1.8000	1.1878	1.3500e-003		0.0841	0.0841		0.0774	0.0774	0.0000	128.6876	128.6876	0.0384	0.0000	129.4943
Total	**0.1538**	**1.8000**	**1.1878**	**1.3500e-003**	**0.2478**	**0.0841**	**0.3319**	**0.1332**	**0.0774**	**0.2105**	**0.0000**	**128.6876**	**128.6876**	**0.0384**	**0.0000**	**129.4943**

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	1.5100e-003	2.0000e-003	0.0192	4.0000e-005	3.2100e-003	3.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.8000e-004	0.0000	3.0977	3.0977	1.7000e-004	0.0000	3.1013
Total	**1.5100e-003**	**2.0000e-003**	**0.0192**	**4.0000e-005**	**3.2100e-003**	**3.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.8000e-004**	**0.0000**	**3.0977**	**3.0977**	**1.7000e-004**	**0.0000**	**3.1013**

3.2 Grading - 2015

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					0.2478	0.0000	0.2478	0.1332	0.0000	0.1332	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1538	1.8000	1.1878	1.3500e-003		0.0841	0.0841		0.0774	0.0774	0.0000	128.6874	128.6874	0.0384	0.0000	129.4942
Total	**0.1538**	**1.8000**	**1.1878**	**1.3500e-003**	**0.2478**	**0.0841**	**0.3319**	**0.1332**	**0.0774**	**0.2105**	**0.0000**	**128.6874**	**128.6874**	**0.0384**	**0.0000**	**129.4942**

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	1.5100e-003	2.0000e-003	0.0192	4.0000e-005	3.2100e-003	3.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.8000e-004	0.0000	3.0977	3.0977	1.7000e-004	0.0000	3.1013
Total	**1.5100e-003**	**2.0000e-003**	**0.0192**	**4.0000e-005**	**3.2100e-003**	**3.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.8000e-004**	**0.0000**	**3.0977**	**3.0977**	**1.7000e-004**	**0.0000**	**3.1013**

3.3 Trenching - 2015

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	0.0171	0.1825	0.1290	1.9000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	17.6238	17.6238	5.2600e-003	0.0000	17.7343
Total	**0.0171**	**0.1825**	**0.1290**	**1.9000e-004**		**0.0112**	**0.0112**		**0.0103**	**0.0103**	**0.0000**	**17.6238**	**17.6238**	**5.2600e-003**	**0.0000**	**17.7343**

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	4.1000e-004	5.5000e-004	5.2700e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8519	0.8519	5.0000e-005	0.0000	0.8529
Total	**4.1000e-004**	**5.5000e-004**	**5.2700e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8519**	**0.8519**	**5.0000e-005**	**0.0000**	**0.8529**

3.3 Trenching - 2015

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	0.0171	0.1825	0.1290	1.9000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	17.6238	17.6238	5.2600e-003	0.0000	17.7343
Total	**0.0171**	**0.1825**	**0.1290**	**1.9000e-004**		**0.0112**	**0.0112**		**0.0103**	**0.0103**	**0.0000**	**17.6238**	**17.6238**	**5.2600e-003**	**0.0000**	**17.7343**

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	4.1000e-004	5.5000e-004	5.2700e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8519	0.8519	5.0000e-005	0.0000	0.8529
Total	**4.1000e-004**	**5.5000e-004**	**5.2700e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8519**	**0.8519**	**5.0000e-005**	**0.0000**	**0.8529**

3.4 Paving - 2015

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	0.0275	0.2958	0.1781	2.6000e-004		0.0170	0.0170		0.0157	0.0157	0.0000	24.9839	24.9839	7.4600e-003	0.0000	25.1406
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0275**	**0.2958**	**0.1781**	**2.6000e-004**		**0.0170**	**0.0170**		**0.0157**	**0.0157**	**0.0000**	**24.9839**	**24.9839**	**7.4600e-003**	**0.0000**	**25.1406**

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	7.5000e-004	9.9000e-004	9.4800e-003	2.0000e-005	1.5900e-003	1.0000e-005	1.6000e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5334	1.5334	8.0000e-005	0.0000	1.5351
Total	**7.5000e-004**	**9.9000e-004**	**9.4800e-003**	**2.0000e-005**	**1.5900e-003**	**1.0000e-005**	**1.6000e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**1.5334**	**1.5334**	**8.0000e-005**	**0.0000**	**1.5351**

3.4 Paving - 2015

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	0.0275	0.2958	0.1781	2.6000e-004		0.0170	0.0170		0.0157	0.0157	0.0000	24.9839	24.9839	7.4600e-003	0.0000	25.1405
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0275**	**0.2958**	**0.1781**	**2.6000e-004**		**0.0170**	**0.0170**		**0.0157**	**0.0157**	**0.0000**	**24.9839**	**24.9839**	**7.4600e-003**	**0.0000**	**25.1405**

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	7.5000e-004	9.9000e-004	9.4800e-003	2.0000e-005	1.5900e-003	1.0000e-005	1.6000e-003	4.2000e-004	1.0000e-005	4.3000e-004	0.0000	1.5334	1.5334	8.0000e-005	0.0000	1.5351
Total	**7.5000e-004**	**9.9000e-004**	**9.4800e-003**	**2.0000e-005**	**1.5900e-003**	**1.0000e-005**	**1.6000e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**1.5334**	**1.5334**	**8.0000e-005**	**0.0000**	**1.5351**

3.5 Building Construction - 2015

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	0.2658	2.1127	1.3400	2.0100e-003		0.1482	0.1482		0.1411	0.1411	0.0000	179.8103	179.8103	0.0388	0.0000	180.6250
Total	**0.2658**	**2.1127**	**1.3400**	**2.0100e-003**		**0.1482**	**0.1482**		**0.1411**	**0.1411**	**0.0000**	**179.8103**	**179.8103**	**0.0388**	**0.0000**	**180.6250**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5300e-003	0.0221	0.0291	5.0000e-005	1.2800e-003	3.5000e-004	1.6300e-003	3.7000e-004	3.2000e-004	6.9000e-004	0.0000	4.2900	4.2900	4.0000e-005	0.0000	4.2908
Worker	2.2200e-003	2.9400e-003	0.0282	6.0000e-005	4.7300e-003	4.0000e-005	4.7700e-003	1.2600e-003	3.0000e-005	1.2900e-003	0.0000	4.5652	4.5652	2.5000e-004	0.0000	4.5705
Total	**4.7500e-003**	**0.0251**	**0.0573**	**1.1000e-004**	**6.0100e-003**	**3.9000e-004**	**6.4000e-003**	**1.6300e-003**	**3.5000e-004**	**1.9800e-003**	**0.0000**	**8.8552**	**8.8552**	**2.9000e-004**	**0.0000**	**8.8613**

3.5 Building Construction - 2015

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	0.2658	2.1127	1.3400	2.0100e-003		0.1482	0.1482		0.1411	0.1411	0.0000	179.8101	179.8101	0.0388	0.0000	180.6247
Total	**0.2658**	**2.1127**	**1.3400**	**2.0100e-003**		**0.1482**	**0.1482**		**0.1411**	**0.1411**	**0.0000**	**179.8101**	**179.8101**	**0.0388**	**0.0000**	**180.6247**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5300e-003	0.0221	0.0291	5.0000e-005	1.2800e-003	3.5000e-004	1.6300e-003	3.7000e-004	3.2000e-004	6.9000e-004	0.0000	4.2900	4.2900	4.0000e-005	0.0000	4.2908
Worker	2.2200e-003	2.9400e-003	0.0282	6.0000e-005	4.7300e-003	4.0000e-005	4.7700e-003	1.2600e-003	3.0000e-005	1.2900e-003	0.0000	4.5652	4.5652	2.5000e-004	0.0000	4.5705
Total	**4.7500e-003**	**0.0251**	**0.0573**	**1.1000e-004**	**6.0100e-003**	**3.9000e-004**	**6.4000e-003**	**1.6300e-003**	**3.5000e-004**	**1.9800e-003**	**0.0000**	**8.8552**	**8.8552**	**2.9000e-004**	**0.0000**	**8.8613**

3.6 Architectural Coating - 2015

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	0.7321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0224	0.1414	0.1046	1.6000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	14.0429	14.0429	1.8300e-003	0.0000	14.0813
Total	**0.7545**	**0.1414**	**0.1046**	**1.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**	**0.0000**	**14.0429**	**14.0429**	**1.8300e-003**	**0.0000**	**14.0813**

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	4.1000e-004	5.5000e-004	5.2700e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8519	0.8519	5.0000e-005	0.0000	0.8529
Total	**4.1000e-004**	**5.5000e-004**	**5.2700e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8519**	**0.8519**	**5.0000e-005**	**0.0000**	**0.8529**

3.6 Architectural Coating - 2015

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	0.7321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0224	0.1414	0.1046	1.6000e-004		0.0122	0.0122		0.0122	0.0122	0.0000	14.0429	14.0429	1.8300e-003	0.0000	14.0813
Total	**0.7545**	**0.1414**	**0.1046**	**1.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**	**0.0000**	**14.0429**	**14.0429**	**1.8300e-003**	**0.0000**	**14.0813**

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	4.1000e-004	5.5000e-004	5.2700e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.8519	0.8519	5.0000e-005	0.0000	0.8529
Total	**4.1000e-004**	**5.5000e-004**	**5.2700e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.8519**	**0.8519**	**5.0000e-005**	**0.0000**	**0.8529**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1728	0.4178	1.8559	3.8600e-003	0.2660	5.2600e-003	0.2712	0.0711	4.8400e-003	0.0760	0.0000	305.8036	305.8036	0.0133	0.0000	306.0824
Unmitigated	0.1728	0.4178	1.8559	3.8600e-003	0.2660	5.2600e-003	0.2712	0.0711	4.8400e-003	0.0760	0.0000	305.8036	305.8036	0.0133	0.0000	306.0824

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	248.82	262.08	228.02	707,381	707,381
Total	248.82	262.08	228.02	707,381	707,381

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.510118	0.073510	0.192396	0.133166	0.036737	0.005265	0.012605	0.021642	0.001847	0.002083	0.006548	0.000610	0.003471

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	65.2541	65.2541	2.6300e-003	5.4000e-004	65.4777
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	65.2541	65.2541	2.6300e-003	5.4000e-004	65.4777
NaturalGas Mitigated	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8502	46.8502	9.0000e-004	8.6000e-004	47.1353
NaturalGas Unmitigated	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8502	46.8502	9.0000e-004	8.6000e-004	47.1353

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	877940	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8502	46.8502	9.0000e-004	8.6000e-004	47.1353
Total		**4.7300e-003**	**0.0405**	**0.0172**	**2.6000e-004**		**3.2700e-003**	**3.2700e-003**		**3.2700e-003**	**3.2700e-003**	**0.0000**	**46.8502**	**46.8502**	**9.0000e-004**	**8.6000e-004**	**47.1353**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	877940	4.7300e-003	0.0405	0.0172	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8502	46.8502	9.0000e-004	8.6000e-004	47.1353
Total		**4.7300e-003**	**0.0405**	**0.0172**	**2.6000e-004**		**3.2700e-003**	**3.2700e-003**		**3.2700e-003**	**3.2700e-003**	**0.0000**	**46.8502**	**46.8502**	**9.0000e-004**	**8.6000e-004**	**47.1353**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	199671	65.2541	2.6300e-003	5.4000e-004	65.4777
Total		**65.2541**	**2.6300e-003**	**5.4000e-004**	**65.4777**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	199671	65.2541	2.6300e-003	5.4000e-004	65.4777
Total		**65.2541**	**2.6300e-003**	**5.4000e-004**	**65.4777**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.8936	0.0244	2.2055	8.0000e-004		0.2834	0.2834		0.2834	0.2834	26.8569	11.5787	38.4356	0.0251	2.1100e-003	39.6177
Unmitigated	1.8936	0.0244	2.2055	8.0000e-004		0.2834	0.2834		0.2834	0.2834	26.8569	11.5787	38.4356	0.0251	2.1100e-003	39.6177

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0732					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1828					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.6314	0.0221	2.0097	7.8000e-004		0.2824	0.2824		0.2823	0.2823	26.8569	11.2634	38.1203	0.0248	2.1100e-003	39.2956
Landscaping	6.1600e-003	2.2900e-003	0.1957	1.0000e-005		1.0600e-003	1.0600e-003		1.0600e-003	1.0600e-003	0.0000	0.3154	0.3154	3.2000e-004	0.0000	0.3221
Total	**1.8936**	**0.0244**	**2.2055**	**7.9000e-004**		**0.2834**	**0.2834**		**0.2834**	**0.2834**	**26.8569**	**11.5787**	**38.4356**	**0.0251**	**2.1100e-003**	**39.6177**

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	0.0732					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1828					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.6314	0.0221	2.0097	7.8000e-004		0.2824	0.2824		0.2823	0.2823	26.8569	11.2634	38.1203	0.0248	2.1100e-003	39.2956
Landscaping	6.1600e-003	2.2900e-003	0.1957	1.0000e-005		1.0600e-003	1.0600e-003		1.0600e-003	1.0600e-003	0.0000	0.3154	0.3154	3.2000e-004	0.0000	0.3221
Total	**1.8936**	**0.0244**	**2.2055**	**7.9000e-004**		**0.2834**	**0.2834**		**0.2834**	**0.2834**	**26.8569**	**11.5787**	**38.4356**	**0.0251**	**2.1100e-003**	**39.6177**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	11.6237	0.0556	1.3900e-003	13.2240
Unmitigated	11.6237	0.0557	1.4000e-003	13.2249

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.694 / 1.06796	11.6237	0.0557	1.4000e-003	13.2249
Total		**11.6237**	**0.0557**	**1.4000e-003**	**13.2249**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.694 / 1.06796	11.6237	0.0556	1.3900e-003	13.2240
Total		**11.6237**	**0.0556**	**1.3900e-003**	**13.2240**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.1588	0.3640	0.0000	13.8022
Unmitigated	6.1588	0.3640	0.0000	13.8022

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	30.34	6.1588	0.3640	0.0000	13.8022
Total		**6.1588**	**0.3640**	**0.0000**	**13.8022**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	30.34	6.1588	0.3640	0.0000	13.8022
Total		**6.1588**	**0.3640**	**0.0000**	**13.8022**

9.0 Operational Offroad

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

10.0 Vegetation