

## **APPENDIX 8-3**

*Otay Ranch Village 14 and Planning Areas 16/19  
On-Site Emissions Reduction Estimates*



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## MEMORANDUM

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**To:** Gregory Mattson, County of San Diego  
**From:** Rose Kelly, Dudek  
**Subject:** Otay Ranch Village 14 and Planning Areas 16/19 On-Site Emissions Reduction Estimates  
**Date:** July 24, 2018  
**cc:** Sean Kilkenny, Dudek; Jennifer Reed, Dudek  
**Attachment(s):** A - CalEEMod Outputs  
B – Solar Hot Water Calculations

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### 1 INTRODUCTION

The purpose of this memorandum is to determine the quantity and percentage of greenhouse gas (GHG) emission reductions achieved through implementation of the on-site project design features (PDFs) set forth for the proposed Otay Ranch Village 14 and Planning Areas 16/19 Project (Proposed Project) in Table 2.7-5 of the Environmental Impact Report (EIR). To estimate the emissions reduced on site, an operational emissions model *without* incorporation of PDFs was developed. GHGs – specifically carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) – were primarily estimated using Version 2016.3.1 of the California Emissions Estimator Model (CalEEMod).<sup>1</sup> GHG emission sources considered in the analysis include area sources, electricity and natural gas consumption, motor vehicles, solid waste generation, and water treatment and conveyance. GHG emissions are measured herein as metric tons (MT) of CO<sub>2</sub> equivalent (CO<sub>2</sub>e).<sup>2</sup>

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<sup>1</sup> As provided in Section 2 of this memorandum, for purposes of this analysis, the Proposed Project's energy-related GHG emissions were estimated using Version 2016.3.2 of CalEEMod. GHG emissions from area sources, mobile sources, solid waste generation, and water/wastewater demand were estimated using Version 2016.3.1.

As background, CalEEMod Version 2016.3.1 was the current version of CalEEMod when the Proposed Project analysis was initiated. In October 2017, CalEEMod Version 2016.3.2 was released, followed by CalEEMod Version 2016.3.2.25 in November 2017, which fixed a Windows security update issue in Version 2016.3.2. CalEEMod Version 2016.3.2 includes five upgrades and ten bug fixes. The most notable upgrade and bug fix, respectively, are the incorporation of percent reductions in default energy consumption to reflect compliance with the 2016 Title 24, Part 6 Building Energy Efficiency Standards and correcting the overestimation of annual construction PM<sub>10</sub> and PM<sub>2.5</sub> emissions from fugitive dust in multiple year scenario runs (SCAQMD 2017).

All CalEEMod Version 2016.3.2 updates were reviewed, and it was determined that use of CalEEMod Version 2016.3.2 is not anticipated to result in greater GHG emissions compared to estimated Proposed Project emissions generated using CalEEMod Version 2016.3.1. Accordingly, use of CalEEMod Version 2016.3.1 is appropriate for the Proposed Project's GHG emissions analysis and the Project without PDFs GHG emissions analysis.

<sup>2</sup> The CO<sub>2</sub>e for a gas is derived by multiplying the mass of the gas by the associated global warming potential (GWP), such that metric tons (MT) of CO<sub>2</sub>e = (MT of a GHG) × (GWP of the GHG). CalEEMod Version 2016.3.1 assumes

## **2 PROJECT DESIGN FEATURES AND METHODOLOGICAL PARAMETERS**

### **Area Sources**

The major area sources included in CalEEMod are hearths, consumer products, architectural coatings, and landscape equipment. Neither consumer products nor architectural coatings result in GHG emissions; therefore, these emission sources are not included in the GHG emissions assessment. Hearths are broken into two categories, both of which are applicable to the residential use of fireplaces and woodstoves. The EIR's PDF-AQ/GHG-1 requires that no woodturning stoves or fireplaces be included in the Proposed Project's residences. To assess the GHG emissions reduction from this PDF, CalEEMod default values for fireplaces and woodstoves, which include both the number of units and hours used per year, were used for the Project without PDFs assessment. Landscape equipment is determined by the acreage of each land use. As with the Proposed Project, CalEEMod default values were utilized for the landscape equipment.

### **Energy Demand**

Energy emissions are broken into electrical consumption and natural gas consumption. CalEEMod determines the total energy demand based on land use type and square feet. PDF-AQ/GHG-2 requires that the Proposed Project's residences achieve Zero Net Energy (ZNE) design standards (per reference to the California Energy Commission's definition of same), and PDF-AQ/GHG-3 requires that all non-residential buildings achieve a 10% increase in energy efficiency beyond that required by the 2016 California Building Code. To assess the GHG savings of these PDFs, the default electricity demand from CalEEMod Version 2016.3.2, which reflects compliance with the 2016 California Building Code, was utilized in the Project without PDFs assessment.<sup>3</sup> The natural gas assumptions from the Proposed Project's Building Analysis were used in the Project without PDFs assessment, as they were higher than the CalEEMod default values (Consol 2017).

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that the GWP for CH<sub>4</sub> is 25, which means that emissions of 1 MT of CH<sub>4</sub> are equivalent to emissions of 25 MT of CO<sub>2</sub>, and the GWP for N<sub>2</sub>O is 298, based on the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (IPCC 2007).

<sup>3</sup> While Version 2016.3.1 was used for the EIR analysis, Version 2016.3.2 energy defaults were utilized for this exercise because those defaults provide a more conservative representation of the incremental reduction in GHG emissions associated with the Proposed Project's energy efficiency-related design features. This is because, at a minimum, the Proposed Project's residential and non-residential development will be subject to the 2016 California Building Code, which applies to building permits issued on and after January 1, 2017.

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PDF-AQ/GHG-4 requires enumerated categories of appliances to meet Energy Star standards. To assess the GHG emissions reduction of this PDF, no Energy Star appliances were assumed in the Proposed Project without PDFs assessment.

PDF-AQ/GHG-5 requires that each pool associated with the Proposed Project's private recreation centers be heated using solar hot water systems. Heating for the recreational pools was calculated outside CalEEMod and included in the GHG emissions inventory separately. The Proposed Project without PDFs assessment assumed that the recreational pools would be heated with natural gas.

Several other PDFs also are relevant to the Proposed Project's energy consumption-related GHG emissions: PDF-AQ/GHG-6 requires all outdoor lighting use LED or other high efficiency light bulbs; PDF-AQ/GHG-7 requires all new home packets to include information on energy efficiency, energy management, and energy incentive programs; and, PDF-AQ/GHG-8 and PDF-AQ/GHG-9 require cool roofs and cool pavements that meet the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) standards. In addition, the Proposed Project's landscaping and vegetation plans would result in the planting of approximately 8,000 new trees, which would serve to sequester carbon and provide shading benefits to minimizing cooling needs.

The emission reduction benefits of PDF-AQ/GHG-6 through PDF-AQ/GHG-9 were not quantified in the Proposed Project's EIR; as such, no changes to the model were made for the Proposed Project without PDFs assessment.

**Mobile Sources**

GHG emissions from mobile sources are estimated based on the vehicle miles traveled (VMT) generated, the vehicle emission factors and the mix of vehicles. CalEEMod Version 2016.3.1 provides default values for vehicle emission factors and vehicle fleet mix, by year, based on the California Air Resources Board's mobile source emissions inventory program known as EMFAC 2014. As assumed for the Proposed Project, CalEEMod's default vehicle emission factors and default fleet mix were used for operational year 2028. A Proposed Project daily VMT of 111,988 was determined by Chen Ryan using a select zone analysis (Chen Ryan 2018a); this VMT value was used in the Project without PDFs assessment. As described in the EIR, PDF-TR-1 requires implementation of a transportation demand management (TDM) program that would reduce the Proposed Project's total VMT by 4.3%, which would reduce the daily VMT to 107,130 (Chen Ryan 2018b). To determine the GHG emissions reduction associated with PDF-TR-1, the daily VMT of 107,130 was utilized in the Project with PDFs assessment.

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Additionally, PDF-AQ/GHG-10 requires the installation of electric vehicle charging equipment in the Proposed Project’s residential and non-residential development areas, which would reduce GHG emissions from the Proposed Project’s vehicle fleet by facilitating the conversion of the vehicle fleet from internal combustion engines powered by gasoline and diesel to zero emission engines. Conservatively, the GHG emissions reductions for encouraging electric vehicle ownership were not quantified.

**Solid Waste Generation**

The Proposed Project did not include any PDFs aimed at increasing solid waste diversion beyond existing regulatory standards and goals. No GHG emissions reductions were calculated.

**Water/Wastewater Demands**

The EIR’s PDF-UT-1 through PDF-UT-5, as enumerated in Table 2.7-5 of the EIR, would reduce water and wastewater demand; conservatively, however, none of these PDFs were quantified and included in the emissions estimates. Instead, the water and wastewater demand estimates used in the Project without PDFs and Project with PDFs assessments were based on the Water Conservation Plan (Dexter Wilson 2018).

**3 PROPOSED PROJECT WITHOUT PROJECT DESIGN FEATURES**

GHG emissions generated by operation of the Proposed Project without PDFs were estimated per the methodological parameters presented above. The Proposed Project without PDFs is estimated to generate a total of 22,233 MT CO<sub>2</sub>e per year. A breakdown of the estimated Proposed Project without PDFs operational emissions is presented in Table 1.

**Table 1**  
**Annual Proposed Project without Project Design Features GHG Emissions (2028)**

Emission Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
	Metric Tons per Year			
Area	1,654.22	1.08	0.09	1,708.31
Energy (Net)	4,757.71	0.18	0.08	4,786.39
Mobile	14,007.62	0.73	0.00	14,025.98
Solid Waste	266.73	15.76	0.00	660.81
Water and Wastewater	873.00	5.49	0.14	1,051.97
<b>Total</b>	<b>21,559.28</b>	<b>23.24</b>	<b>0.31</b>	<b>22,233.46</b>

**Source:** Dudek 2018.

**Notes:** Energy includes 1,279 MT CO<sub>2</sub>e from pool heating demand (see Attachment B).

#### 4 PROPOSED PROJECT WITH PROJECT DESIGN FEATURES

GHG emissions generated by operation of the Proposed Project with implementation of the numbered PDFs and tree plantings were estimated in the Greenhouse Gas Emissions Technical Report for Otay Ranch Village 14 and Planning Areas 16/19 (Dudek 2018). As presented therein, prior to implementation of Mitigation Measure M-GHG-2, the Proposed Project with PDFs is estimated to generate a total of 16,159 MT CO<sub>2</sub>e per year. A breakdown of the estimated Proposed Project with PDFs operational emissions is presented in Table 2.

**Table 2**  
**Annual Proposed Project GHG Emissions with Project Design Features (2028)**

Emission Source	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e
	Metric Tons per Year			
Area Sources	13.58	0.01	0.00	13.91
Energy	1,119.97	0.12	0.05	1,136.97
Mobile	13,466.72	0.71	0.00	13,484.49
Solid Waste Generation	266.73	15.76	0.00	660.81
Water Demand	873.00	5.49	0.14	1,051.97
Carbon Sequestration from Tree Plantings	(188.80)	0.00	0.00	(188.80)
<b>Total</b>	<b>15,551.2</b>	<b>22.09</b>	<b>0.19</b>	<b>16,159.35</b>

Source: Dudek 2018.

Notes: Numbers may not add exactly due to rounding. Numbers presented in parentheses for carbon sequestration represent an emissions saving/reduction; i.e., a negative number.

#### 5 GHG EMISSIONS COMPARISON

As presented in Table 3, the Proposed Project's PDFs would result in a decrease of approximately 6,074 MT CO<sub>2</sub>e per year as a result of on-site reductions.

**Table 3**  
**GHG Emissions Reduction from On-Site Project Design Features (2028)**

Emission Source	Metric Tons of CO <sub>2</sub> e per Year		
	Proposed Project without PDFs	Proposed Project with PDFs	On-Site Reduction
Area Sources	1,708.31	13.91	1,694.40
Energy	4,786.39	1,136.97	3,649.42
Mobile	14,025.98	13,484.49	541.49
Solid Waste	660.81	660.81	0
Water/Wastewater	1,051.97	1,051.97	0

**Table 3**  
**GHG Emissions Reduction from On-Site Project Design Features (2028)**

Emission Source	Metric Tons of CO <sub>2</sub> e per Year		
	<i>Proposed Project without PDFs</i>	<i>Proposed Project with PDFs</i>	<i>On-Site Reduction</i>
Carbon Sequestration from Tree Plantings	0.00	(188.80)	(188.80)
<b>Total</b>	<b>22,233.46</b>	<b>16,159.35</b>	<b>6,074.11</b>

**Source:** Dudek 2018.

**Notes:** Numbers may not add exactly due to rounding. Numbers presented in parentheses for carbon sequestration represent an emissions saving/reduction; i.e., a negative number.

When viewed over the 30-year project life, without PDFs, the Proposed Project’s emissions would total 667,004 MT CO<sub>2</sub>e. However, with implementation of the PDFs and the tree plantings, the Proposed Project’s emissions would total 484,781 MT CO<sub>2</sub>e.

When described on an annual basis, a decrease in 6,074 MT CO<sub>2</sub>e per year represents a 27.32% reduction in the Proposed Project’s GHG emissions through the implementation of on-site emissions-reducing strategies. In order to achieve no net increase in GHG emissions, the Proposed Project would secure the remaining necessary reductions (72.68% of the total emissions) through off-site emissions-reducing strategies. (Note that the quantitative characterization of the Proposed Project’s on-site reductions is conservative as it does not include the quantification of PDF-AQ/GHG-6 through PDF-AQ/GHG-10.)

## 6 REFERENCES

Chen Ryan. 2018a. *Transportation Impact Analysis. Otay Ranch Village 14 and Planning Areas 16/19, Draft Report*. February 9, 2018.

Chen Ryan. 2018b. *Transportation Demand Management (TDM) Program Evaluation. Otay Ranch Village 14 and Planning Areas 16/19 Memorandum*. February 9, 2018.

ConSol. 2017. *Jackson Pendo Development Company Building Analysis*. February 2017.

Dexter Wilson. 2018. *Otay Ranch Village 14 and Planning Areas 16/19 Water Conservation Plan*. February 2018.

Dudek. 2018. *Greenhouse Gas Emissions Technical Report for Otay Ranch Village 14 and Planning Areas 16/19*. February 2018.



# **APPENDIX A**

## *CalEEMod Outputs*



Proctor Valley EIR Operational - San Diego County, Annual

**Proctor Valley EIR Operational  
San Diego County, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	8.50	1000sqft	2.10	8,500.00	0
Parking Lot	629.00	1000sqft	14.44	629,496.00	0
City Park	13.90	Acre	13.90	1,260.00	0
Recreational Swimming Pool	4.00	1000sqft	3.70	4,000.00	0
Single Family Housing	994.00	Dwelling Unit	361.10	2,898,410.00	2762
User Defined Residential	125.00	Dwelling Unit	368.00	591,125.00	344
Regional Shopping Center	10.00	1000sqft	1.50	10,000.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.6	<b>Precipitation Freq (Days)</b>	40
<b>Climate Zone</b>	13			<b>Operational Year</b>	2028
<b>Utility Company</b>	San Diego Gas & Electric				
<b>CO2 Intensity (lb/MW hr)</b>	427.49	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - to match proposed project

Land Use - to match proposed project

Construction Phase - to match proposed project

Off-road Equipment - Operational Emissions Modeled Separately

Trips and VMT - Operational Run

Vehicle Trips - Chen Ryan 2017

Woodstoves - Default

Area Coating - Default

Energy Use - Energy data to match 2016 California Building Code

Water And Wastewater - to match project

Solid Waste - to match project

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	12,400.00	0.00
tblEnergyUse	LightingElect	3.91	3.81
tblEnergyUse	LightingElect	0.88	0.75
tblEnergyUse	LightingElect	6.39	6.22
tblEnergyUse	LightingElect	0.00	0.34
tblEnergyUse	NT24E	6,680.41	6,155.97
tblEnergyUse	NT24E	0.00	1.30
tblEnergyUse	NT24NG	4,180.00	4,500.00
tblEnergyUse	NT24NG	0.00	0.95
tblEnergyUse	T24E	4.88	4.66
tblEnergyUse	T24E	3.34	3.18
tblEnergyUse	T24E	374.93	331.07
tblEnergyUse	T24E	0.00	0.07
tblEnergyUse	T24NG	16.07	15.99
tblEnergyUse	T24NG	1.15	1.14

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tblEnergyUse	T24NG	24,312.55	22,000.00
tblEnergyUse	T24NG	0.00	4.65
tblFleetMix	FleetMixLandUseSubType	Industrial Park	City Park
tblFleetMix	FleetMixLandUseSubType	Parking Lot	Industrial Park
tblFleetMix	FleetMixLandUseSubType	City Park	Parking Lot
tblFleetMix	FleetMixLandUseSubType	Single Family Housing	Regional Shopping Center
tblFleetMix	FleetMixLandUseSubType	User Defined Residential	Single Family Housing
tblFleetMix	FleetMixLandUseSubType	Regional Shopping Center	User Defined Residential
tblLandUse	BuildingSpaceSquareFeet	629,000.00	629,496.00
tblLandUse	BuildingSpaceSquareFeet	0.00	1,260.00
tblLandUse	BuildingSpaceSquareFeet	0.00	4,000.00
tblLandUse	BuildingSpaceSquareFeet	1,789,200.00	2,898,410.00
tblLandUse	BuildingSpaceSquareFeet	0.00	591,125.00
tblLandUse	GreenSpaceSquareFeet	605,484.00	0.00
tblLandUse	LandUseSquareFeet	629,000.00	629,496.00
tblLandUse	LandUseSquareFeet	605,484.00	1,260.00
tblLandUse	LandUseSquareFeet	1,789,200.00	2,898,410.00
tblLandUse	LandUseSquareFeet	0.00	591,125.00
tblLandUse	LotAcreage	0.20	2.10
tblLandUse	LotAcreage	0.09	3.70
tblLandUse	LotAcreage	322.73	361.10
tblLandUse	LotAcreage	0.00	368.00
tblLandUse	LotAcreage	0.23	1.50
tblLandUse	Population	2,843.00	2,762.00
tblLandUse	Population	358.00	344.00
tblLandUse	RecSwimmingAreaSquareFeet	4,000.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	720.49	427.49
tblProjectCharacteristics	OperationalYear	2018	2028
tblSolidWaste	SolidWasteGenerationRate	1.20	0.00
tblSolidWaste	SolidWasteGenerationRate	10.54	0.00
tblSolidWaste	SolidWasteGenerationRate	22.80	0.00
tblSolidWaste	SolidWasteGenerationRate	10.50	0.00
tblSolidWaste	SolidWasteGenerationRate	1,132.42	1,314.00
tblTripsAndVMT	VendorTripLength	7.30	0.00
tblTripsAndVMT	VendorTripNumber	227.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	0.00
tblTripsAndVMT	WorkerTripNumber	721.00	0.00
tblVehicleTrips	CC_TL	7.30	8.78
tblVehicleTrips	CC_TL	7.30	8.78
tblVehicleTrips	CC_TL	7.30	8.78
tblVehicleTrips	CC_TL	7.30	8.78
tblVehicleTrips	CC_TL	7.30	8.78
tblVehicleTrips	CC_TTP	48.00	100.00
tblVehicleTrips	CC_TTP	28.00	100.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CC_TTP	48.00	100.00
tblVehicleTrips	CC_TTP	64.70	100.00
tblVehicleTrips	CC_TTP	0.00	100.00

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tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CNW_TL	7.30	8.78
tblVehicleTrips	CNW_TL	7.30	8.78
tblVehicleTrips	CNW_TL	7.30	8.78
tblVehicleTrips	CNW_TL	7.30	8.78
tblVehicleTrips	CNW_TL	7.30	8.78
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	8.78
tblVehicleTrips	CW_TL	9.50	8.78
tblVehicleTrips	CW_TL	9.50	8.78
tblVehicleTrips	CW_TL	9.50	8.78
tblVehicleTrips	CW_TL	9.50	8.78
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	CW_TTP	16.30	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	DV_TP	19.00	0.00
tblVehicleTrips	DV_TP	39.00	0.00
tblVehicleTrips	DV_TP	35.00	0.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	7.50	8.78
tblVehicleTrips	HO_TL	7.50	8.78
tblVehicleTrips	HO_TTP	39.60	0.00
tblVehicleTrips	HO_TTP	39.60	0.00
tblVehicleTrips	HS_TL	7.30	8.78

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tblVehicleTrips	HS_TL	7.30	8.78
tblVehicleTrips	HS_TTP	18.80	0.00
tblVehicleTrips	HS_TTP	18.80	0.00
tblVehicleTrips	HW_TL	10.80	8.78
tblVehicleTrips	HW_TL	10.80	8.78
tblVehicleTrips	HW_TTP	0.00	100.00
tblVehicleTrips	HW_TTP	0.00	100.00
tblVehicleTrips	HW_TTP	0.00	100.00
tblVehicleTrips	HW_TTP	0.00	100.00
tblVehicleTrips	HW_TTP	0.00	100.00
tblVehicleTrips	HW_TTP	41.60	100.00
tblVehicleTrips	HW_TTP	41.60	100.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PB_TP	2.00	0.00
tblVehicleTrips	PB_TP	9.00	0.00
tblVehicleTrips	PB_TP	11.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	66.00	100.00
tblVehicleTrips	PR_TP	79.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	52.00	100.00
tblVehicleTrips	PR_TP	54.00	100.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	22.75	60.19
tblVehicleTrips	ST_TR	2.49	0.73
tblVehicleTrips	ST_TR	9.10	8.88
tblVehicleTrips	ST_TR	49.97	128.73
tblVehicleTrips	ST_TR	9.91	10.41



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tblVehicleTrips	ST_TR	0.00	12.49
tblVehicleTrips	SU_TR	16.74	44.29
tblVehicleTrips	SU_TR	0.73	0.22
tblVehicleTrips	SU_TR	13.60	13.27
tblVehicleTrips	SU_TR	25.24	65.02
tblVehicleTrips	SU_TR	8.62	9.05
tblVehicleTrips	SU_TR	0.00	10.87
tblVehicleTrips	WD_TR	1.89	5.00
tblVehicleTrips	WD_TR	6.83	1.88
tblVehicleTrips	WD_TR	33.82	33.00
tblVehicleTrips	WD_TR	42.70	110.00
tblVehicleTrips	WD_TR	9.52	10.00
tblVehicleTrips	WD_TR	0.00	12.00
tblWater	IndoorWaterUseRate	1,965,625.00	749,162.50
tblWater	IndoorWaterUseRate	236,572.58	0.00
tblWater	IndoorWaterUseRate	740,725.21	553,887.50
tblWater	IndoorWaterUseRate	64,763,101.47	165,520,955.00
tblWater	OutdoorWaterUseRate	16,561,590.76	18,327,380.00
tblWater	OutdoorWaterUseRate	0.00	749,162.50
tblWater	OutdoorWaterUseRate	144,996.10	0.00
tblWater	OutdoorWaterUseRate	453,992.87	553,887.50
tblWater	OutdoorWaterUseRate	40,828,911.79	165,520,955.00

## 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					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

#### 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					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

## 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	89.7328	1.4669	94.9772	0.1575		12.1981	12.1981		12.1981	12.1981	1,155.8797	498.3431	1,654.2228	1.0797	0.0909	1,708.3093
Energy	0.1609	1.3855	0.6608	8.7800e-003		0.1112	0.1112		0.1112	0.1112	0.0000	3,487.1355	3,487.1355	0.1590	0.0558	3,507.7365
Mobile	4.3047	17.8069	42.1418	0.1507	15.3978	0.1127	15.5105	4.1218	0.1046	4.2264	0.0000	14,007.6198	14,007.6198	0.7342	0.0000	14,025.9752
Waste						0.0000	0.0000		0.0000	0.0000	266.7301	0.0000	266.7301	15.7633	0.0000	660.8126
Water						0.0000	0.0000		0.0000	0.0000	52.9256	820.0773	873.0028	5.4916	0.1399	1,051.9725
<b>Total</b>	<b>94.1985</b>	<b>20.6593</b>	<b>137.7798</b>	<b>0.3170</b>	<b>15.3978</b>	<b>12.4219</b>	<b>27.8197</b>	<b>4.1218</b>	<b>12.4139</b>	<b>16.5357</b>	<b>1,475.5354</b>	<b>18,813.1756</b>	<b>20,288.7110</b>	<b>23.2279</b>	<b>0.2866</b>	<b>20,954.8061</b>

### 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	89.7328	1.4669	94.9772	0.1575		12.1981	12.1981		12.1981	12.1981	1,155.8797	498.3431	1,654.2228	1.0797	0.0909	1,708.3093
Energy	0.1609	1.3855	0.6608	8.7800e-003		0.1112	0.1112		0.1112	0.1112	0.0000	3,454.7333	3,454.7333	0.1569	0.0553	3,475.1439
Mobile	4.3047	17.8069	42.1418	0.1507	15.3978	0.1127	15.5105	4.1218	0.1046	4.2264	0.0000	14,007.6198	14,007.6198	0.7342	0.0000	14,025.9752
Waste						0.0000	0.0000		0.0000	0.0000	266.7301	0.0000	266.7301	15.7633	0.0000	660.8126
Water						0.0000	0.0000		0.0000	0.0000	52.9256	820.0773	873.0028	5.4916	0.1399	1,051.9725
<b>Total</b>	<b>94.1985</b>	<b>20.6593</b>	<b>137.7798</b>	<b>0.3170</b>	<b>15.3978</b>	<b>12.4219</b>	<b>27.8197</b>	<b>4.1218</b>	<b>12.4139</b>	<b>16.5357</b>	<b>1,475.5354</b>	<b>18,780.7734</b>	<b>20,256.3088</b>	<b>23.2257</b>	<b>0.2861</b>	<b>20,922.2135</b>

	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
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.17</b>	<b>0.16</b>	<b>0.01</b>	<b>0.16</b>	<b>0.16</b>

## 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	4.3047	17.8069	42.1418	0.1507	15.3978	0.1127	15.5105	4.1218	0.1046	4.2264	0.0000	14,007.6198	14,007.6198	0.7342	0.0000	14,025.9752
Unmitigated	4.3047	17.8069	42.1418	0.1507	15.3978	0.1127	15.5105	4.1218	0.1046	4.2264	0.0000	14,007.6198	14,007.6198	0.7342	0.0000	14,025.9752

### 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	139.00	1,673.28	1231.26	821,704	821,704
Industrial Park	31.96	12.41	3.74	40,166	40,166
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	264.00	71.04	106.16	341,781	341,781
Regional Shopping Center	2,200.00	2,574.60	1300.40	3,395,665	3,395,665
Single Family Housing	19,880.00	20,695.08	17991.40	31,522,382	31,522,382
User Defined Residential	3,000.00	3,122.50	2717.50	4,757,355	4,757,355
<b>Total</b>	<b>25,514.96</b>	<b>28,148.91</b>	<b>23,350.46</b>	<b>40,879,052</b>	<b>40,879,052</b>

### 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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	8.78	8.78	8.78	0.00	100.00	0.00	100	0	0
Industrial Park	8.78	8.78	8.78	0.00	100.00	0.00	100	0	0
Parking Lot	8.78	8.78	8.78	0.00	100.00	0.00	100	0	0
Recreational Swimming Pool	8.78	8.78	8.78	0.00	100.00	0.00	100	0	0
Regional Shopping Center	8.78	8.78	8.78	0.00	100.00	0.00	100	0	0
Single Family Housing	8.78	8.78	8.78	100.00	0.00	0.00	100	0	0
User Defined Residential	8.78	8.78	8.78	100.00	0.00	0.00	100	0	0

### 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
Industrial Park	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
Parking Lot	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
Recreational Swimming Pool	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
Regional Shopping Center	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
Single Family Housing	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837
User Defined Residential	0.614571	0.037691	0.177673	0.098627	0.012633	0.005296	0.017422	0.025155	0.001929	0.001711	0.005676	0.000778	0.000837

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

	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	1,862.0790	1,862.0790	0.1263	0.0261	1,873.0252
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,894.4811	1,894.4811	0.1285	0.0266	1,905.6179
NaturalGas Mitigated	0.1609	1.3855	0.6608	8.7800e-003		0.1112	0.1112		0.1112	0.1112	0.0000	1,592.6543	1,592.6543	0.0305	0.0292	1,602.1187
NaturalGas Unmitigated	0.1609	1.3855	0.6608	8.7800e-003		0.1112	0.1112		0.1112	0.1112	0.0000	1,592.6543	1,592.6543	0.0305	0.0292	1,602.1187

**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					
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
Industrial Park	171615	9.3000e-004	8.4100e-003	7.0700e-003	5.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	9.1580	9.1580	1.8000e-004	1.7000e-004	9.2125
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
Recreational Swimming Pool	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
Regional Shopping Center	22300	1.2000e-004	1.0900e-003	9.2000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1900	1.1900	2.0000e-005	2.0000e-005	1.1971
Single Family Housing	2.6341e+007	0.1420	1.2138	0.5165	7.7500e-003		0.0981	0.0981		0.0981	0.0981	0.0000	1,405.6561	1,405.6561	0.0269	0.0258	1,414.0092
User Defined Residential	3.3103e+006	0.0179	0.1623	0.1363	9.7000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	176.6502	176.6502	3.3900e-003	3.2400e-003	177.7000
<b>Total</b>		<b>0.1609</b>	<b>1.3855</b>	<b>0.6608</b>	<b>8.7800e-003</b>		<b>0.1112</b>	<b>0.1112</b>		<b>0.1112</b>	<b>0.1112</b>	<b>0.0000</b>	<b>1,592.6543</b>	<b>1,592.6543</b>	<b>0.0305</b>	<b>0.0292</b>	<b>1,602.1187</b>

**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					
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
Industrial Park	171615	9.3000e-004	8.4100e-003	7.0700e-003	5.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	9.1580	9.1580	1.8000e-004	1.7000e-004	9.2125
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
Recreational Swimming Pool	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
Regional Shopping Center	22300	1.2000e-004	1.0900e-003	9.2000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1900	1.1900	2.0000e-005	2.0000e-005	1.1971
Single Family Housing	2.6341e+007	0.1420	1.2138	0.5165	7.7500e-003		0.0981	0.0981		0.0981	0.0981	0.0000	1,405.6561	1,405.6561	0.0269	0.0258	1,414.0092
User Defined Residential	3.3103e+006	0.0179	0.1623	0.1363	9.7000e-004		0.0123	0.0123		0.0123	0.0123	0.0000	176.6502	176.6502	3.3900e-003	3.2400e-003	177.7000
<b>Total</b>		<b>0.1609</b>	<b>1.3855</b>	<b>0.6608</b>	<b>8.7800e-003</b>		<b>0.1112</b>	<b>0.1112</b>		<b>0.1112</b>	<b>0.1112</b>	<b>0.0000</b>	<b>1,592.6543</b>	<b>1,592.6543</b>	<b>0.0305</b>	<b>0.0292</b>	<b>1,602.1187</b>

### 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
Industrial Park	114240	22.1518	1.5000e-003	3.1000e-004	22.2821
Parking Lot	472122	91.5474	6.2100e-003	1.2800e-003	92.0856
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	125600	24.3546	1.6500e-003	3.4000e-004	24.4978
Single Family Housing	8.0473e+006	1,560.4223	0.1059	0.0219	1,569.5952
User Defined Residential	1.01082e+006	196.0050	0.0133	2.7500e-003	197.1572
<b>Total</b>		<b>1,894.4811</b>	<b>0.1285</b>	<b>0.0266</b>	<b>1,905.6179</b>

#### 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
Industrial Park	114240	22.1518	1.5000e-003	3.1000e-004	22.2821
Parking Lot	472122	91.5474	6.2100e-003	1.2800e-003	92.0856
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	125600	24.3546	1.6500e-003	3.4000e-004	24.4978
Single Family Housing	7.8802e+006	1,528.0201	0.1037	0.0215	1,537.0026
User Defined Residential	1.01082e+006	196.0050	0.0133	2.7500e-003	197.1572
<b>Total</b>		<b>1,862.0790</b>	<b>0.1263</b>	<b>0.0261</b>	<b>1,873.0252</b>



## 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	89.7328	1.4669	94.9772	0.1575		12.1981	12.1981		12.1981	12.1981	1,155.8797	498.3431	1,654.2228	1.0797	0.0909	1,708.3093
Unmitigated	89.7328	1.4669	94.9772	0.1575		12.1981	12.1981		12.1981	12.1981	1,155.8797	498.3431	1,654.2228	1.0797	0.0909	1,708.3093

### 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	5.5081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	13.7619					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	70.2130	1.3712	86.6703	0.1570		12.1520	12.1520		12.1520	12.1520	1,155.8797	484.7591	1,640.6388	1.0667	0.0909	1,694.3996
Landscaping	0.2498	0.0957	8.3069	4.4000e-004		0.0461	0.0461		0.0461	0.0461	0.0000	13.5840	13.5840	0.0130	0.0000	13.9097
<b>Total</b>	<b>89.7328</b>	<b>1.4669</b>	<b>94.9772</b>	<b>0.1575</b>		<b>12.1981</b>	<b>12.1981</b>		<b>12.1981</b>	<b>12.1981</b>	<b>1,155.8797</b>	<b>498.3431</b>	<b>1,654.2228</b>	<b>1.0797</b>	<b>0.0909</b>	<b>1,708.3093</b>

#### 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	5.5081					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	13.7619					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	70.2130	1.3712	86.6703	0.1570		12.1520	12.1520		12.1520	12.1520	1,155.8797	484.7591	1,640.6388	1.0667	0.0909	1,694.3996
Landscaping	0.2498	0.0957	8.3069	4.4000e-004		0.0461	0.0461		0.0461	0.0461	0.0000	13.5840	13.5840	0.0130	0.0000	13.9097
<b>Total</b>	<b>89.7328</b>	<b>1.4669</b>	<b>94.9772</b>	<b>0.1575</b>		<b>12.1981</b>	<b>12.1981</b>		<b>12.1981</b>	<b>12.1981</b>	<b>1,155.8797</b>	<b>498.3431</b>	<b>1,654.2228</b>	<b>1.0797</b>	<b>0.0909</b>	<b>1,708.3093</b>

**7.0 Water Detail**

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**7.1 Mitigation Measures Water**

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	873.0028	5.4916	0.1399	1,051.9725
Unmitigated	873.0028	5.4916	0.1399	1,051.9725

## 7.2 Water by Land Use

### Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 18.3274	39.4826	2.6800e-003	5.5000e-004	39.7147
Industrial Park	0.749162 / 0.749162	3.7431	0.0247	6.3000e-004	4.5458
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.553887 / 0.553887	2.7675	0.0182	4.6000e-004	3.3609
Single Family Housing	165.521 / 165.521	827.0096	5.4460	0.1382	1,004.3511
User Defined Residential	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>873.0028</b>	<b>5.4916</b>	<b>0.1399</b>	<b>1,051.9725</b>

### Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 18.3274	39.4826	2.6800e-003	5.5000e-004	39.7147
Industrial Park	0.749162 / 0.749162	3.7431	0.0247	6.3000e-004	4.5458
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.553887 / 0.553887	2.7675	0.0182	4.6000e-004	3.3609
Single Family Housing	165.521 / 165.521	827.0096	5.4460	0.1382	1,004.3511
User Defined Residential	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>873.0028</b>	<b>5.4916</b>	<b>0.1399</b>	<b>1,051.9725</b>

**8.0 Waste Detail**

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**8.1 Mitigation Measures Waste**

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	266.7301	15.7633	0.0000	660.8126
Unmitigated	266.7301	15.7633	0.0000	660.8126

## 8.2 Waste by Land Use

### Unmitigated

Land Use	Waste Disposed tons	Total CO2	CH4	N2O	CO2e
		MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Industrial Park	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1314	266.7301	15.7633	0.0000	660.8126
User Defined Residential	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>266.7301</b>	<b>15.7633</b>	<b>0.0000</b>	<b>660.8126</b>

### Mitigated

Land Use	Waste Disposed tons	Total CO2	CH4	N2O	CO2e
		MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Industrial Park	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1314	266.7301	15.7633	0.0000	660.8126
User Defined Residential	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>266.7301</b>	<b>15.7633</b>	<b>0.0000</b>	<b>660.8126</b>

**9.0 Operational Offroad**

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

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**Fire Pumps and Emergency Generators**

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

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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**11.0 Vegetation**

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# **APPENDIX B**

## *Solar Hot Water Calculations*





**Pool Energy Demand - Proctor Valley**

Average Pool Size in SCE Study (gallons)	Hours of Operation per Day	Average Heater Size from SCE Study (kBtu/hr)	hour/year	kBtu/year	kBtu/year (efficiency)	kBtu/gal/year	MMBtu/gal/year
28,210	12	410	4,380	1,795,800	1,580,304	56.02	0.056

**Total Potential CO<sub>2</sub>e Emissions from Pool Energy Demand**

Facility Name	Pool Volume (gal)	MMBtu/gal/year	MMBtu/year	lb. CO <sub>2</sub> e/ MMBtu	lb. CO <sub>2</sub> e/ year	MT/CO <sub>2</sub> e/ year
PP2	180,956	0.056	10,137	118.35	1,199,717	545.33
PP4	81,861		4,586		542,729	246.69
PP1	157,260		8,810		1,042,615	473.92
<b>Total</b>						<b>1,265.94</b>

**Total Potential Energy Demand**

Facility Name	Pool Volume (gal)	MMBtu/gal/year	MMBtu/year
All pools	420,077	0.056	23,532

Notes: Pool hours of operation assume 12 hours daily.

89-95% efficiency (US Department of Energy). Heaters in the Proposed Project were assumed to use 90% efficient heaters.

**Polutant Emissions from Pool Heating**

Polutant	lb./MMBtu	MMBtu/day	lb./day
ROG	0.010784314	64.47	0.70
SO <sub>2</sub>	0.000588235		0.04
NO <sub>x</sub>	0.092156863		5.94
PM <sub>10</sub>	0.00745098		0.48
PM <sub>2.5</sub>	0.00745098		0.48
CO	0.039215686		2.53

