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September 13, 2013, Revised December 23, 2013

Mr. Gregg Haggart
Gildred Building Company, LLC
550 West C Street, Suite 1820
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**RE: Greenhouse Gas (GHG) Review - Ocotillo Wells Solar Farm (APN 253-390-57),
(APN 253-290-58) – San Diego County**

The purpose of this greenhouse gas screening letter is to identify potential Greenhouse Gas (GHG) impacts, if any, which may be created from the construction and operation of the proposed photovoltaic solar farm (Project) to be constructed near the town of Ocotillo Wells in eastern San Diego County. The Project proposes to construct a solar farm with capacity to produce between 42 and 54 megawatts of power over 338 acres of a 440 acre site, employing either photovoltaic (PV) panels or concentrated photovoltaic (CPV) panels.

Guidelines for Determining Significance of GHG Emissions

The County of San Diego has several applicable guidelines for determining the significance of a project's GHG emissions. In 2010, the County adopted its Interim Approach to Addressing Climate Change In CEQA Documents (May 7, 2010), which establishes a 900 metric ton (MT) screening criteria for carbon dioxide (CO₂) or carbon dioxide equivalent (CO₂e) emissions.¹ Please refer to the County's Interim Approach document for more information at http://www.sdcounty.ca.gov/pds/docs/Interim_Approach_to_Addressing_Climate_Change_in_CEQA_Documents.pdf. Projects that do not emit at least 900 MT CO₂e, or metric tons of carbon dioxide equivalent emissions, are not required to prepare a GHG analysis and are presumed to have a less than significant impact.

¹ CO₂ equivalent (CO₂e) is a measurement used to account for the fact that different GHGs have different global warming potentials (GWP) based on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, 1 ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂ on a 100-year timescale, making CH₄ a much more potent GHG than CO₂.

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In 2012, the County developed Draft Guidelines for Determining Significance (June 20, 2012). The Draft Guidelines employ four implementing threshold options, or guidelines for determining significance for GHGs, all of which are compliant with the California Global Warming Solutions Act of 2006 – Assembly Bill 32 (AB32), Senate Bill 97 (SB97), and California Environmental Quality Act (CEQA). Please refer to the Draft Guidelines at http://www.sdcounty.ca.gov/pds/advance/Draft_Guidelines_for_Determining_Significance_Climate_Change.pdf. The four thresholds are the Efficiency Threshold, Bright Line Threshold (BLT), Stationary Source Threshold, and Performance Threshold.

The most pertinent threshold applicable to the Project under the Draft Guidelines is the BLT, which would consider a project to have a cumulatively considerable contribution to climate change impacts if it would result in a net increase of operational GHG emissions, either directly or indirectly, at a level exceeding 2,500 MTCO₂e per year. Projects which exceed the BLT would be required to introduce mitigation measures to reduce GHG emissions below the BLT or utilize any other method to reach compliance. Notably, the BLT does not consider construction GHG emissions in the significance threshold because such emissions for San Diego County land use projects between 2012 and 2020 were quantified and incorporated into the BLT.

For purposes of this analysis, the Project will be analyzed according to the screening thresholds under the Interim Guidelines' 900 MTCO₂e screening threshold since they are more conservative. Under the 900 MTCO₂e threshold methodology, it is recommended that construction emissions be averaged over a 30-year period to represent a worst case yearly estimate.

Description of the Project's GHG Emitting Activities

The Project will complete rough grading in approximately three months, which would include all grubbing and site work in preparation for the either the CPV or PV systems. It's expected that approximately 370,000 CY of balanced earthwork will be required based on the worst case design chosen. Trenching and construction of the solar farm would then begin and is expected to be completed within one month. The total construction would be expected to be completed in approximately eleven months. During construction, the contractor will either drive piles or set concrete footings or bases into the ground, to which the solar panels will be attached. Table 1 on the following page shows the expected construction timeframes assumed for the proposed Project, and equipment type and duration of use for such construction.

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Also, as a requirement for dust control, the Project would import roughly 13,000,000 gallons of water from a site 24 miles away. Assuming the Project utilizes 4,000 Gallon water trucks, the Project would generate 3,250 truck trips or 156,000 Vehicle Miles Traveled (VMT). Other construction activities would include trenching and building construction for erection of the solar panels.

Table 1: Proposed Construction Phase and Duration

Equipment Identification	Estimated Duration (Days)	Quantity	Hours per day
Mass Site Grading	97		
Graders		3	8
Tractors/Loaders/Backhoes		5	8
Water Trucks		8	8
Rubber Tired Dozers		4	8
Trenching	36		
Tractors/Loaders/Backhoes		5	8
Trenchers		2	8
Water Trucks		1	8
Building Construction	216		
Cranes		2	8
Air Compressors		2	7
Forklifts		1	8
Generator Sets		1	8
Other Industrial Equipment (Hydraulic Pile Driver)		1	8
Welders		1	8
This equipment list is based upon equipment inventory within URBEMIS2007. The quantity and types are based upon assumptions from projects of similar size and scope.			

Once construction is completed, the proposed Project would begin generating GHG emissions from operational maintenance and regular employee daily trips. Maintenance activities such as cleaning panels and soil binding activities could require approximately 674,000 gallons of water for panel washing and an additional 0.85 Acre Feet (approximate) of water for soil binding maintenance activities each year for a total of about 947,973 Gallons of water. Assuming the Project imports this water from a site 24 miles away and utilizes 4,000 Gallon

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water trucks, the Project would generate 474 trucks trips or 11,376 VMT per year. It should be noted that if well water onsite is suitable for washing the solar panels, the Project would utilize this source instead. This scenario would generate far fewer trips and would therefore be less intense and is not analyzed within this letter.

Also, a second option would be to pump water onsite and use a filtration system which would consist of a light truck mounted reverse osmosis (RO) system with a 90% recovery rate. The RO units can produce 3 gpm or 1,440 gpd. A total of six (6) RO trucks on a 20 work day work schedule will be required to wash the panels each quarter. This assumes a worst case scenario of 168,489 gals of estimated water usage per quarter. The RO units with a 90% recovery rate will produce 16,851 gals of brine wastewater per quarter or 842.5 gal per day. The brine wastewater will be collected on-site within a 10,000 gal reservoir. The brine wastewater will be trucked off site quarterly via 5,000 gal capacity trucks to the City of San Diego Wastewater pumping station No. 1 or No. 2 on East Harbor Drive, San Diego. A total of 4 one-way trips (8 ADT, or round-trips) per quarter or 16 one-way (32 ADT, or round-trips) per year will be required to dispose of the brine wastewater. Given a round trip is expected to be roughly 150 miles; the filtration method would generate 2,400 VMT. This method is less intense than transporting the water onsite from the nearby water district.

Finally, the project would generate approximately 10 trips per day with up to 25 daily trips occurring during maintenance periods from the regular employees working at the facility. For purposes of providing a worst-case analysis, Ldn Consulting assumed that a worst-case generation of 25 trips would occur daily and that these trips could originate over 100 miles away which would add an additional 2,500 VMTs total.

Project Related Construction Emissions

Utilizing the URBEMIS 2007 inputs for the model as shown in Table 1 above, we find that grading and construction of the Project would produce approximately 1,228.49 Tons of GHG. For purposes of analysis and comparison to the County's thresholds, LDN Consulting converted the emissions to Metric Tons (MT) or 1,114.61 MT of CO₂ during construction. The URBEMIS model outputs are provided as **Attachment A** to this report.

In order to get a clear picture of the Project's GHG emissions associated with construction, we also need to calculate CH₄ and N₂O emissions, which are also GHGs considered under AB 32. Section III.7.3 within the California Climate Action Registry General Reporting Protocol Version 3.1- January 2009 (CCARGRPV3.1) recommends utilizing fuel consumption to calculate these

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values. However, since fuel consumption isn't known, it was estimated using the CO₂ output equation solved directly for fuel consumed and utilizing CO₂ estimates for URBEMIS 2007 as the known variable. The pertinent equation is shown below:

$$\text{Fuel Consumed (Gallons)} = \frac{\text{CO}_2 \text{ Emission (Metric Tons)}}{10.15 \frac{\text{kg CO}_2}{\text{gallon}} * .001 \frac{\text{Metric Tons}}{\text{kg}}}$$

Given this, we estimate the construction emissions to require 109,813 Gallons of fuel.

Or,

$$\text{GAL} = 1,114.61 \text{ Metric Tons CO}_2 / (10.15 \text{ kg CO}_2 \text{ gallon} \times 0.001 \text{ Metric Tons kg}) = 109,813 \text{ GAL}$$

Based on the fact that the Project is expected to require 109,813 gallons of fuel for construction, we estimate that the Project would generate 289.79 grams of N₂O and 646.47 grams of CH₄ or 0.3 and 0.06 MT respectively. Multiplying them by 310 and 21 converts those quantities in the form of CO₂e which works out to 8.85 and 1.34 MTCO₂e.² Combined with Emissions calculated with URBMEIS 2007, the total GHG emissions associated with equipment used onsite would be 1,124.80 MTCO₂e. The average emission rate per year would be 34.16 MTCO₂e which is the GHG output divide by 30-years.

Finally, construction emissions from daily dust suppression water delivery trips will be quantified utilizing emission levels reported in grams/mile from the EMFAC2007 emission model. For the estimated 156,000 VMTs necessary for transporting the 13,000,000 gallons of water needed for dust control, the emissions can be determined using the equation below:³

$$\text{GHG (Metric Tons)} = \text{Emission Factor} \left(\frac{\text{g}}{\text{mile}} \right) \times \text{Annual Mileage} \times 0.000001 \left(\frac{\text{Metric ton}}{\text{g}} \right)$$

Utilizing both emission levels from the EMFAC2007 model and the GHG equation above, transporting the water for dust suppression is expected to generate an additional 259.07

² The global warming potential (GWP) of N₂O as compared to CO₂ is 310, and the GWP of CH₄ is 21.

³ [EMFAC 2007 Emission factors are 1613 for CO₂, 0.014 for CH₄ and 0.153 for N₂O]

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MTCO₂e. A summary of the total construction emissions is shown in Table 2 below. The EMFAC2007 model for construction emissions are provided as **Attachment B** to this report.

Table 2: Expected Construction Emissions Summary

Year	Operation	CO ₂ (Tons)	CO ₂ (Metric Tons)	N ₂ O	CH ₄	Total CO ₂ e (Metric Tons)	30 Year Average (Metric Tons)
2013	Construction	1,228.49	1,114.61	8.85	1.34	1,124.80	37.49
2013	Construction Water Transport	285.55	251.63	7.40	0.05	259.07	8.64
Total		1,514.04	1,366.24	16.25	1.39	1,383.87	46.13
Expected Construction emissions are based upon URBEMIS modeling assumptions above. Metric Tons = .9073*Tons Water Transport emissions based on multiplying EMFAC emission factors with VMT Year 2013 construction emissions are divided by 30 years consistent with recommendations for the 900 MT GHG threshold.							

Project Related Operational Emissions

As discussed, emissions generated from operations would occur from the transport of 947,973 Gallons of water 24 miles away requiring 11,376 VMT per year and from VMTs from regular employee trips. Operations involving the movement of water would have emission rates identified within the Construction Emissions section in Footnote 3.

Emissions for regular employees would be much lower ⁴ for passenger cars which were also determined by EMFAC2007. Using similar methods for calculating GHGs during construction it's estimated that operations would produce only 338.552 MTCO₂e which is shown in Table 3 on the following page. The EMFAC2007 model for the operational emissions from regular employee trips is provided as **Attachment C** to this report.

⁴ [EMFAC 2007 Emission factors are 311.331 for CO₂, 0.011 for CH₄ and 0.125 for N₂O]

Table 3: Expected Construction Emissions Summary

Year	CO ₂ (Metric Tons)	N ₂ O	CH ₄	Total CO ₂ e (Metric Tons)
Annual operational emissions (Water Transport)	18.35	0.540	0.003	18.892
Annual operations Employee Trips	284.090	35.359	0.211	319.660
Operations Total	302.440	35.899	0.214	338.552
Total Construction Emissions				46.13
Project Total (Per Year)				384.682
Operational emissions based on multiplying EMFAC emission factors with VMT				

Significance Conclusion for the Project's GHG Emissions

Based upon the findings for the proposed solar development, the average construction emissions are expected to be only 46.13 MTCO₂e while Operational emissions are expected to be 338.552 MTCO₂e. Combined, emissions would be 384.682 MTCO₂e which is far below the 2010 Interim Guideline of 900 MTCO₂e per year screening level and would by default meet the BLT of 2,500. Therefore, no mitigation is necessary. Therefore, the project conforms to the goals of AB 32 and would not result in any direct GHG impacts.

GHG Offset from Generation of Clean Renewable Energy

The Project would be capable of producing between 42 and 54 megawatts (MW) of power at peak production periods. For purposes of this estimate, it was assumed that electricity can be produced at this level daily for about five hours or 1,825 hours per year. During this timeframe, it can be expected that between 76,650 and 98,550 megawatt hours (MWH) would be produced annually. The electricity generated will not require the consumption of fossil fuels, and will not emit GHGs. Therefore, since electricity was produced without increasing GHGs directly, it can be assumed that this production would offset utility GHG emissions offsite from fossil-fuel fired electricity generation.

Converting this energy output into a realized GHG savings, LDN Consulting utilized the CCARGRPV3.1 which estimates CO₂, CH₄, and N₂O from electricity use or otherwise saved based on GHG gas emission factors:

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$$GHG(\text{Metric Tons}) = \frac{\text{Electricity Use (kWh)} \times \text{Electricity Emission Factor} \left(\frac{\text{lbs GHG}}{\text{kWh}} \right)}{2,204 \frac{\text{lbs}}{\text{metric ton}}}$$

The electricity emission factors are published within the CCARGRPV3.1 document CO₂, CH₄, and N₂O in California are 0.72412, 0.0000302, and 0.0000081, respectively. Therefore, the Project would save between 25,281.31 and 32,504.54 MTCO₂e which is shown in Tables 4 and 5 below, respectively.

Table 4: Annual Total GHG Emissions Saved (42 MW Output)

GHG	Emission Factor eGRID Subregion WECC California (lbs/KWh)	Energy Usage (KWh)	Conversion lbs/metric ton	Total (Metric Tons)	GWP	CO ₂ e (Metric Tons)
CO ₂	0.72412	76,650,000	2,204.62	25,171.957	1	25,171.96
CH ₄	0.000030	76,650,000	2,204.62	1.050	21	22.05
N ₂ O	0.0000081	76,650,000	2,204.62	0.282	310	87.30
Total						25,281.31
Yearly Emissions						-384.682
Total Offset per Year						24,896.63
Note: Data is presented in decimal format and may have rounding errors.						

Table 5: Annual Total GHG Emissions Saved (54 MW Output)

GHG	Emission Factor eGRID Subregion WECC California (lbs/KWh)	Energy Usage (KWh)	Conversion lbs/metric ton	Total (Metric Tons)	GWP	CO ₂ e (Metric Tons)
CO ₂	0.72412	98,550,000	2,204.62	32,363.945	1	32,363.945
CH ₄	0.000030	98,550,000	2,204.62	1.050	21	28.350
N ₂ O	0.0000081	98,550,000	2,204.62	0.282	310	112.246
Total Saved						32,504.54
Yearly Emissions						-384.682
Total Offset per Year						32,119.86
Note: Data is presented in decimal format and may have rounding errors.						

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Conclusion

Based on our analysis, the project would not produce significant cumulatively considerable GHG impacts as under the County's Interim Guidelines dated in 2010. To the contrary, the Project would offset between approximately [24,897 MTCO₂e] to [32,120] MTCO₂e per year, depending on the ultimate output size of the project, which is the equivalent of offsetting the total GHG emissions for 2,553 to 3,283 average California households.⁵ If you have any questions, please do not hesitate to contact me directly at (760) 473-1253.

Sincerely,
Ldn Consulting, Inc.



Jeremy Loudon

Attachment A: URBEMIS 2007 Annual Output

Attachment B: EMFAC 2020 Output (Heavy Diesel Equipment)

Attachment C: EMFAC 2020 Output (Passenger Cars from regular employees)

Attachment D: Curriculum Vitae

⁵ See U.S. Energy Information Administration, State-Level Energy-Related Carbon-Dioxide Emissions: 2000-2010 (May 2013), available at <http://www.eia.gov/environment/emissions/state/analysis/pdf/stateanalysis.pdf>. The average California household in 2010 is estimated to emit approximately 9.9 MTCO₂e per year.

Attachment A

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Gildred 11-30.urb924

Project Name: Gildred Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2013 TOTALS (tons/year unmitigated)	0.97	8.00	5.12	0.00	27.40	0.37	27.77	5.72	0.34	6.07	1,228.49
2013 TOTALS (tons/year mitigated)	0.97	8.00	5.12	0.00	2.85	0.37	3.23	0.60	0.34	0.94	1,228.49
Percent Reduction	0.00	0.00	0.00	0.00	89.59	0.00	88.38	89.54	0.00	84.47	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.74	0.60	4.43	0.00	0.81	0.16	441.40

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.74	0.60	4.43	0.00	0.81	0.16	441.40

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Attachment A

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	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2013	0.97	8.00	5.12	0.00	27.40	0.37	27.77	5.72	0.34	6.07	1,228.49
Mass Grading 01/01/2013-04/08/2013	0.62	5.58	3.74	0.00	27.39	0.25	27.64	5.72	0.23	5.95	914.83
Mass Grading Dust	0.00	0.00	0.00	0.00	27.38	0.00	27.38	5.72	0.00	5.72	0.00
Mass Grading Off Road Diesel	0.48	3.90	2.04	0.00	0.00	0.18	0.18	0.00	0.17	0.17	441.37
Mass Grading On Road Diesel	0.12	1.61	0.57	0.00	0.01	0.06	0.07	0.00	0.06	0.06	314.03
Mass Grading Worker Trips	0.02	0.06	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.44
Building 04/09/2013-11/15/2013	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Off Road Diesel	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	0.06	0.38	0.41	0.00	0.00	0.03	0.03	0.00	0.03	0.03	63.58
Trenching Off Road Diesel	0.05	0.37	0.24	0.00	0.00	0.03	0.03	0.00	0.03	0.03	38.98
Trenching Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.60

Phase Assumptions

Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

Total Acres Disturbed: 338

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5781 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 2228.57

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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8 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 4/9/2013 - 5/15/2013 - Trenching Phase One

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 4/9/2013 - 11/15/2013 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Other General Industrial Equipment (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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Attachment A

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2013	0.97	8.00	5.12	0.00	2.85	0.37	3.23	0.60	0.34	0.94	1,228.49
Mass Grading 01/01/2013-04/08/2013	0.62	5.58	3.74	0.00	2.85	0.25	3.10	0.60	0.23	0.83	914.83
Mass Grading Dust	0.00	0.00	0.00	0.00	2.83	0.00	2.83	0.59	0.00	0.59	0.00
Mass Grading Off Road Diesel	0.48	3.90	2.04	0.00	0.00	0.18	0.18	0.00	0.17	0.17	441.37
Mass Grading On Road Diesel	0.12	1.61	0.57	0.00	0.01	0.06	0.07	0.00	0.06	0.06	314.03
Mass Grading Worker Trips	0.02	0.06	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.44
Building 04/09/2013-11/15/2013	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Off Road Diesel	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	0.06	0.38	0.41	0.00	0.00	0.03	0.03	0.00	0.03	0.03	63.58
Trenching Off Road Diesel	0.05	0.37	0.24	0.00	0.00	0.03	0.03	0.00	0.03	0.03	38.98
Trenching Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.60

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

For Soil Stabilizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 34% PM25: 34%

For Soil Stabilizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 34% PM25: 34%

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	ROG	NOX	CO	SO2	PM10	PM25	CO2
PV Park	0.74	0.60	4.43	0.00	0.81	0.16	441.40
TOTALS (tons/year, unmitigated)	0.74	0.60	4.43	0.00	0.81	0.16	441.40

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
PV Park		0.07	acres	368.00	25.76	2,576.00
					25.76	2,576.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.6	1.0	98.8	0.2
Light Truck < 3750 lbs	10.9	1.8	93.6	4.6
Light Truck 3751-5750 lbs	21.8	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.6	1.0	99.0	0.0

Attachment A

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	62.9	37.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	100.0	0.0	100.0	100.0	100.0	100.0
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	90.0	0.0	10.0			
% of Trips - Commercial (by land use)						
PV Park				2.0	1.0	97.0

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 100 miles

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Operational Changes to Defaults

Home-based shop urban trip length changed from 7.3 miles to 0 miles

Home-based other urban trip length changed from 7.5 miles to 100 miles

Commercial-based commute urban trip length changed from 9.5 miles to 100 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 100 miles

Commercial-based customer urban trip length changed from 7.35 miles to 100 miles

state average 2020

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected

Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 1: Running Exhaust Emissions

(grams/mile)

Pollutant Name: Methane
 Relative Humidity: 60%

Temperature: 60F

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
30	0.000	0.000	0.000	0.019	0.000	0.000
0.019						
35	0.000	0.000	0.000	0.017	0.000	0.000
0.017						

Pollutant Name: Carbon Monoxide
 Relative Humidity: 60%

Temperature: 60F

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
30	0.000	0.000	0.000	2.178	0.000	0.000
2.178						
35	0.000	0.000	0.000	1.980	0.000	0.000
1.980						

Pollutant Name: Oxides of Nitrogen
 Relative Humidity: 60%

Temperature: 60F

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						

state average 2020

4.941	30	0.000	0.000	0.000	4.941	0.000	0.000
4.667	35	0.000	0.000	0.000	4.667	0.000	0.000

Pollutant Name: Carbon Dioxide Temperature: 60F
 Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
30	0.000	0.000	0.000	1675.449	0.000	0.000
1675.449						
35	0.000	0.000	0.000	1613.970	0.000	0.000
1613.970						

Pollutant Name: Sulfur Dioxide Temperature: 60F
 Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
30	0.000	0.000	0.000	0.016	0.000	0.000
0.016						
35	0.000	0.000	0.000	0.015	0.000	0.000
0.015						

Pollutant Name: PM10 Temperature: 60F
 Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
30	0.000	0.000	0.000	0.195	0.000	0.000
0.195						
35	0.000	0.000	0.000	0.188	0.000	0.000
0.188						

Pollutant Name: PM10 - Tire Wear Temperature: 60F
 Relative Humidity: 60%

state average 2020

	Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL							
0.026	30	0.000	0.000	0.000	0.026	0.000	0.000
0.026	35	0.000	0.000	0.000	0.026	0.000	0.000

Pollutant Name: PM10 - Brake Wear Temperature: 60F
 Relative Humidity: 60%

	Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL							
0.022	30	0.000	0.000	0.000	0.022	0.000	0.000
0.022	35	0.000	0.000	0.000	0.022	0.000	0.000

Pollutant Name: Gasoline - mi/gal Temperature: 60F
 Relative Humidity: 60%

	Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL							
15.326	30	0.000	0.000	0.000	15.326	0.000	0.000
17.500	35	0.000	0.000	0.000	17.500	0.000	0.000

Pollutant Name: Diesel - mi/gal Temperature: 60F
 Relative Humidity: 60%

	Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY
ALL							
5.779	30	0.000	0.000	0.000	5.779	0.000	0.000
5.953	35	0.000	0.000	0.000	5.953	0.000	0.000

state average 2020

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 2: Starting Emissions

(grams/trip)

Pollutant Name: Methane
 Relative Humidity: ALL

Temperature: 60F

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	0.008	0.000	0.000
0.008						
10	0.000	0.000	0.000	0.014	0.000	0.000
0.014						
20	0.000	0.000	0.000	0.026	0.000	0.000
0.026						
30	0.000	0.000	0.000	0.037	0.000	0.000
0.037						
40	0.000	0.000	0.000	0.046	0.000	0.000
0.046						
50	0.000	0.000	0.000	0.054	0.000	0.000
0.054						
60	0.000	0.000	0.000	0.061	0.000	0.000
0.061						
120	0.000	0.000	0.000	0.055	0.000	0.000
0.055						
180	0.000	0.000	0.000	0.058	0.000	0.000
0.058						
240	0.000	0.000	0.000	0.062	0.000	0.000
0.062						
300	0.000	0.000	0.000	0.065	0.000	0.000

Attachment B

state average 2020

0.065	360	0.000	0.000	0.000	0.068	0.000	0.000
0.068	420	0.000	0.000	0.000	0.071	0.000	0.000
0.071	480	0.000	0.000	0.000	0.074	0.000	0.000
0.074	540	0.000	0.000	0.000	0.076	0.000	0.000
0.076	600	0.000	0.000	0.000	0.079	0.000	0.000
0.079	660	0.000	0.000	0.000	0.082	0.000	0.000
0.082	720	0.000	0.000	0.000	0.084	0.000	0.000
0.084							

Pollutant Name: Carbon Monoxide
Relative Humidity: ALL

Temperature: 60F

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	2.184	0.000	0.000
2.184						
10	0.000	0.000	0.000	4.192	0.000	0.000
4.192						
20	0.000	0.000	0.000	7.953	0.000	0.000
7.953						
30	0.000	0.000	0.000	11.376	0.000	0.000
11.376						
40	0.000	0.000	0.000	14.460	0.000	0.000
14.460						
50	0.000	0.000	0.000	17.205	0.000	0.000
17.205						
60	0.000	0.000	0.000	19.612	0.000	0.000
19.612						
120	0.000	0.000	0.000	15.883	0.000	0.000
15.883						
180	0.000	0.000	0.000	16.381	0.000	0.000
16.381						
240	0.000	0.000	0.000	16.890	0.000	0.000
16.890						
300	0.000	0.000	0.000	17.411	0.000	0.000
17.411						
360	0.000	0.000	0.000	17.943	0.000	0.000
17.943						
420	0.000	0.000	0.000	18.487	0.000	0.000
18.487						
480	0.000	0.000	0.000	19.043	0.000	0.000

Attachment B

state average 2020							
19.043							
540	0.000	0.000	0.000	19.610	0.000	0.000	
19.610							
600	0.000	0.000	0.000	20.188	0.000	0.000	
20.188							
660	0.000	0.000	0.000	20.778	0.000	0.000	
20.778							
720	0.000	0.000	0.000	21.379	0.000	0.000	
21.379							

Pollutant Name: Oxides of Nitrogen
Relative Humidity: ALL

Temperature: 60F

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	0.366	0.000	0.000
0.366	10	0.000	0.000	0.551	0.000	0.000
0.551	20	0.000	0.000	0.876	0.000	0.000
0.876	30	0.000	0.000	1.141	0.000	0.000
1.141	40	0.000	0.000	1.346	0.000	0.000
1.346	50	0.000	0.000	1.490	0.000	0.000
1.490	60	0.000	0.000	1.575	0.000	0.000
1.575	120	0.000	0.000	1.598	0.000	0.000
1.598	180	0.000	0.000	1.592	0.000	0.000
1.592	240	0.000	0.000	1.583	0.000	0.000
1.583	300	0.000	0.000	1.571	0.000	0.000
1.571	360	0.000	0.000	1.556	0.000	0.000
1.556	420	0.000	0.000	1.538	0.000	0.000
1.538	480	0.000	0.000	1.516	0.000	0.000
1.516	540	0.000	0.000	1.492	0.000	0.000
1.492	600	0.000	0.000	1.464	0.000	0.000
1.464	660	0.000	0.000	1.433	0.000	0.000

state average 2020

1.433	720	0.000	0.000	0.000	1.399	0.000	0.000
1.399							

Pollutant Name: Carbon Dioxide Temperature: 60F
 Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	2.812	0.000	0.000
2.812						
10	0.000	0.000	0.000	5.477	0.000	0.000
5.477						
20	0.000	0.000	0.000	10.761	0.000	0.000
10.761						
30	0.000	0.000	0.000	15.985	0.000	0.000
15.985						
40	0.000	0.000	0.000	21.149	0.000	0.000
21.149						
50	0.000	0.000	0.000	26.253	0.000	0.000
26.253						
60	0.000	0.000	0.000	31.297	0.000	0.000
31.297						
120	0.000	0.000	0.000	53.138	0.000	0.000
53.138						
180	0.000	0.000	0.000	62.713	0.000	0.000
62.713						
240	0.000	0.000	0.000	71.722	0.000	0.000
71.722						
300	0.000	0.000	0.000	80.167	0.000	0.000
80.167						
360	0.000	0.000	0.000	88.047	0.000	0.000
88.047						
420	0.000	0.000	0.000	95.361	0.000	0.000
95.361						
480	0.000	0.000	0.000	102.110	0.000	0.000
102.110						
540	0.000	0.000	0.000	108.294	0.000	0.000
108.294						
600	0.000	0.000	0.000	113.914	0.000	0.000
113.914						
660	0.000	0.000	0.000	118.968	0.000	0.000
118.968						
720	0.000	0.000	0.000	123.456	0.000	0.000
123.456						

state average 2020

Pollutant Name: Sulfur Dioxide Temperature: 60F
 Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
10	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
20	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
30	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
40	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
50	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
60	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
120	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
180	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
240	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
300	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
360	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
420	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
480	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
540	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
600	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
660	0.000	0.000	0.000	0.001	0.000	0.000
0.001						
720	0.000	0.000	0.000	0.002	0.000	0.000
0.002						

Pollutant Name: PM10 Temperature: 60F
 Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						

state average 2020

0.000	5	0.000	0.000	0.000	0.000	0.000	0.000
0.001	10	0.000	0.000	0.000	0.001	0.000	0.000
0.001	20	0.000	0.000	0.000	0.001	0.000	0.000
0.002	30	0.000	0.000	0.000	0.002	0.000	0.000
0.003	40	0.000	0.000	0.000	0.003	0.000	0.000
0.003	50	0.000	0.000	0.000	0.003	0.000	0.000
0.003	60	0.000	0.000	0.000	0.003	0.000	0.000
0.005	120	0.000	0.000	0.000	0.005	0.000	0.000
0.005	180	0.000	0.000	0.000	0.005	0.000	0.000
0.005	240	0.000	0.000	0.000	0.005	0.000	0.000
0.005	300	0.000	0.000	0.000	0.005	0.000	0.000
0.005	360	0.000	0.000	0.000	0.005	0.000	0.000
0.006	420	0.000	0.000	0.000	0.006	0.000	0.000
0.006	480	0.000	0.000	0.000	0.006	0.000	0.000
0.006	540	0.000	0.000	0.000	0.006	0.000	0.000
0.006	600	0.000	0.000	0.000	0.006	0.000	0.000
0.006	660	0.000	0.000	0.000	0.006	0.000	0.000
0.006	720	0.000	0.000	0.000	0.006	0.000	0.000

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected
 Season : Annual
 Area : San Diego

state average 2020

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 4: Hot Soak Emissions

(grams/trip)

Pollutant Name: Methane
 Relative Humidity: ALL

Temperature: 60F

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
5	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000

Hot soak results are scaled to reflect zero emissions for trip
 lengths of less than 5 minutes (about 25% of in-use trips).

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

state average 2020

Table 5a: Partial Day Diurnal Loss

Emissions (grams/hour)

Pollutant Name: Methane
Relative Humidity: ALL

Temperature: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
60	0.000	0.000	0.000	0.000	0.000	0.000
0.000						

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/09/13 06:08:52
Scen Year: 2020 -- All model years in the range 1976 to 2020
selected

Season : Annual
Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
Basin Average

Basin Average

Table 5b: Multi-Day Diurnal Loss

Emissions (grams/hour)

Pollutant Name: Methane
Relative Humidity: ALL

Temperature: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
60	0.000	0.000	0.000	0.000	0.000	0.000
0.000						

state average 2020

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected

Season : Annual

Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 6a: Partial Day Resting Loss

Emissions (grams/hour)

Pollutant Name: Methane
 Relative Humidity: ALL

Temperature: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
60	0.000	0.000	0.000	0.000	0.000	0.000
0.000						

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected

Season : Annual

Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 6b: Multi-Day Resting Loss

Emissions (grams/hour)

state average 2020

Pollutant Name: Methane
Relative Humidity: ALL

Temperature: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
60	0.000	0.000	0.000	0.000	0.000	0.000
0.000						

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/09/13 06:08:52
Scen Year: 2020 -- All model years in the range 1976 to 2020
selected
Season : Annual
Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
Basin Average

Basin Average

Table 7: Estimated Travel Fractions

Pollutant Name:
Relative Humidity: ALL

Temperature: ALL

	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
%VMT	0.000	0.000	0.000	1.000	0.000	0.000
1.000						
%TRIP	0.000	0.000	0.000	1.000	0.000	0.000
1.000						
%VEH	0.000	0.000	0.000	1.000	0.000	0.000
1.000						

state average 2020

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/09/13 06:08:52
 Scen Year: 2020 -- All model years in the range 1976 to 2020
 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego
 Basin Average

Basin Average

Table 8: Evaporative Running Loss

Emissions (grams/minute)

Pollutant Name: Methane
 Relative Humidity: ALL

Temperature: 60F

Time min	LDA	LDT	MDT	HDT	UBUS	MCY
ALL						
1	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
2	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
3	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
4	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
5	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
10	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
15	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
20	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
25	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
30	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
35	0.000	0.000	0.000	0.000	0.000	0.000
0.000						
40	0.000	0.000	0.000	0.000	0.000	0.000
0.000						

state average 2020							
0.000	45	0.000	0.000	0.000	0.000	0.000	0.000
0.000	50	0.000	0.000	0.000	0.000	0.000	0.000
0.000	55	0.000	0.000	0.000	0.000	0.000	0.000
0.000	60	0.000	0.000	0.000	0.000	0.000	0.000
0.000							

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state average 2020

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/05/22 00:17:12
 Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Methane Temperature: 65F Relative Humidity:
 65%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	0.010	0.013	0.000	0.000	0.000	0.000	0.011

Pollutant Name: Carbon Monoxide Temperature: 65F Relative Humidity:
 65%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	1.042	1.316	0.000	0.000	0.000	0.000	1.151

Pollutant Name: Oxides of Nitrogen Temperature: 65F Relative Humidity:
 65%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	0.112	0.146	0.000	0.000	0.000	0.000	0.125

Pollutant Name: Carbon Dioxide Temperature: 65F Relative Humidity:
 65%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	281.289	357.045	0.000	0.000	0.000	0.000	311.331

Pollutant Name: Sulfur Dioxide Temperature: 65F Relative Humidity:
 65%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL

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45	0.003	0.003	state average 2020 0.000	0.000	0.000	0.000	0.003
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65% Pollutant Name: PM10 Temperature: 65F Relative Humidity:

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	0.008	0.018	0.000	0.000	0.000	0.000	0.012

65% Pollutant Name: PM10 - Tire Wear Temperature: 65F Relative Humidity:

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	0.008	0.008	0.000	0.000	0.000	0.000	0.008

65% Pollutant Name: PM10 - Brake wear Temperature: 65F Relative Humidity:

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	0.013	0.013	0.000	0.000	0.000	0.000	0.013

65% Pollutant Name: Gasoline - mi/gal Temperature: 65F Relative Humidity:

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	31.312	24.667	0.000	0.000	0.000	0.000	28.683

65% Pollutant Name: Diesel - mi/gal Temperature: 65F Relative Humidity:

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
45	28.569	29.080	0.000	0.000	0.000	0.000	28.998

Title : 2020 BAU
Version : Emfac2007 v2.3 Nov 1 2006
Run Date : 2012/05/22 00:17:12
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual

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state average 2020

Area : San Diego

*****Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

	San Diego	Basin Average	Basin
Average			

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Methane Temperature: 65F Relative Humidity:
ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.002	0.002	0.000	0.000	0.000	0.000	0.002
10	0.003	0.003	0.000	0.000	0.000	0.000	0.003
20	0.007	0.006	0.000	0.000	0.000	0.000	0.006
30	0.009	0.008	0.000	0.000	0.000	0.000	0.009
40	0.012	0.011	0.000	0.000	0.000	0.000	0.011
50	0.014	0.013	0.000	0.000	0.000	0.000	0.014
60	0.016	0.014	0.000	0.000	0.000	0.000	0.015
120	0.021	0.020	0.000	0.000	0.000	0.000	0.021
180	0.018	0.018	0.000	0.000	0.000	0.000	0.018
240	0.019	0.019	0.000	0.000	0.000	0.000	0.019
300	0.020	0.020	0.000	0.000	0.000	0.000	0.020
360	0.021	0.021	0.000	0.000	0.000	0.000	0.021
420	0.022	0.022	0.000	0.000	0.000	0.000	0.022
480	0.023	0.023	0.000	0.000	0.000	0.000	0.023
540	0.024	0.024	0.000	0.000	0.000	0.000	0.024
600	0.025	0.025	0.000	0.000	0.000	0.000	0.025
660	0.026	0.026	0.000	0.000	0.000	0.000	0.026
720	0.027	0.027	0.000	0.000	0.000	0.000	0.027

Pollutant Name: Carbon Monoxide Temperature: 65F Relative Humidity:
ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.359	0.379	0.000	0.000	0.000	0.000	0.367
10	0.705	0.746	0.000	0.000	0.000	0.000	0.721
20	1.362	1.447	0.000	0.000	0.000	0.000	1.394
30	1.969	2.103	0.000	0.000	0.000	0.000	2.021
40	2.529	2.715	0.000	0.000	0.000	0.000	2.601
50	3.040	3.284	0.000	0.000	0.000	0.000	3.134
60	3.502	3.808	0.000	0.000	0.000	0.000	3.620
120	5.025	5.587	0.000	0.000	0.000	0.000	5.242
180	3.977	4.589	0.000	0.000	0.000	0.000	4.213
240	4.204	4.918	0.000	0.000	0.000	0.000	4.479
300	4.413	5.212	0.000	0.000	0.000	0.000	4.721
360	4.604	5.473	0.000	0.000	0.000	0.000	4.939
420	4.777	5.701	0.000	0.000	0.000	0.000	5.134
480	4.932	5.895	0.000	0.000	0.000	0.000	5.304
540	5.070	6.055	0.000	0.000	0.000	0.000	5.450
600	5.190	6.182	0.000	0.000	0.000	0.000	5.573
660	5.292	6.275	0.000	0.000	0.000	0.000	5.672
720	5.376	6.335	0.000	0.000	0.000	0.000	5.746

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state average 2020

Pollutant Name: Oxides of Nitrogen Temperature: 65F Relative Humidity:
ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.099	0.208	0.000	0.000	0.000	0.000	0.141
10	0.115	0.227	0.000	0.000	0.000	0.000	0.158
20	0.144	0.261	0.000	0.000	0.000	0.000	0.189
30	0.168	0.290	0.000	0.000	0.000	0.000	0.215
40	0.186	0.313	0.000	0.000	0.000	0.000	0.235
50	0.200	0.331	0.000	0.000	0.000	0.000	0.250
60	0.209	0.343	0.000	0.000	0.000	0.000	0.261
120	0.219	0.367	0.000	0.000	0.000	0.000	0.276
180	0.223	0.374	0.000	0.000	0.000	0.000	0.281
240	0.221	0.371	0.000	0.000	0.000	0.000	0.279
300	0.219	0.367	0.000	0.000	0.000	0.000	0.276
360	0.216	0.361	0.000	0.000	0.000	0.000	0.272
420	0.212	0.354	0.000	0.000	0.000	0.000	0.267
480	0.208	0.345	0.000	0.000	0.000	0.000	0.260
540	0.202	0.334	0.000	0.000	0.000	0.000	0.253
600	0.196	0.322	0.000	0.000	0.000	0.000	0.244
660	0.189	0.308	0.000	0.000	0.000	0.000	0.235
720	0.181	0.292	0.000	0.000	0.000	0.000	0.224

Pollutant Name: Carbon Dioxide Temperature: 65F Relative Humidity:
ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	11.569	14.677	0.000	0.000	0.000	0.000	12.769
10	13.259	16.776	0.000	0.000	0.000	0.000	14.617
20	17.095	21.555	0.000	0.000	0.000	0.000	18.817
30	21.538	27.109	0.000	0.000	0.000	0.000	23.688
40	26.588	33.437	0.000	0.000	0.000	0.000	29.232
50	32.247	40.540	0.000	0.000	0.000	0.000	35.448
60	38.512	48.418	0.000	0.000	0.000	0.000	42.336
120	87.451	110.293	0.000	0.000	0.000	0.000	96.269
180	99.548	125.505	0.000	0.000	0.000	0.000	109.569
240	111.561	140.621	0.000	0.000	0.000	0.000	122.780
300	123.492	155.642	0.000	0.000	0.000	0.000	135.903
360	135.338	170.569	0.000	0.000	0.000	0.000	148.939
420	147.101	185.400	0.000	0.000	0.000	0.000	161.887
480	158.781	200.136	0.000	0.000	0.000	0.000	174.746
540	170.377	214.777	0.000	0.000	0.000	0.000	187.518
600	181.890	229.323	0.000	0.000	0.000	0.000	200.202
660	193.319	243.775	0.000	0.000	0.000	0.000	212.798
720	204.665	258.131	0.000	0.000	0.000	0.000	225.305

Pollutant Name: Sulfur Dioxide Temperature: 65F Relative Humidity:
ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
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			state average 2020				
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.000	0.001	0.000	0.000	0.000	0.000	0.000
120	0.001	0.001	0.000	0.000	0.000	0.000	0.001
180	0.001	0.001	0.000	0.000	0.000	0.000	0.001
240	0.001	0.001	0.000	0.000	0.000	0.000	0.001
300	0.001	0.002	0.000	0.000	0.000	0.000	0.001
360	0.001	0.002	0.000	0.000	0.000	0.000	0.002
420	0.001	0.002	0.000	0.000	0.000	0.000	0.002
480	0.002	0.002	0.000	0.000	0.000	0.000	0.002
540	0.002	0.002	0.000	0.000	0.000	0.000	0.002
600	0.002	0.002	0.000	0.000	0.000	0.000	0.002
660	0.002	0.002	0.000	0.000	0.000	0.000	0.002
720	0.002	0.003	0.000	0.000	0.000	0.000	0.002

Pollutant Name: PM10

Temperature: 65F Relative Humidity:

ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.000	0.000	0.000	0.000	0.001
10	0.001	0.003	0.000	0.000	0.000	0.000	0.002
20	0.002	0.005	0.000	0.000	0.000	0.000	0.003
30	0.003	0.007	0.000	0.000	0.000	0.000	0.005
40	0.005	0.010	0.000	0.000	0.000	0.000	0.007
50	0.006	0.012	0.000	0.000	0.000	0.000	0.008
60	0.006	0.014	0.000	0.000	0.000	0.000	0.009
120	0.010	0.022	0.000	0.000	0.000	0.000	0.015
180	0.011	0.025	0.000	0.000	0.000	0.000	0.016
240	0.012	0.027	0.000	0.000	0.000	0.000	0.018
300	0.013	0.029	0.000	0.000	0.000	0.000	0.019
360	0.014	0.030	0.000	0.000	0.000	0.000	0.020
420	0.015	0.032	0.000	0.000	0.000	0.000	0.021
480	0.015	0.033	0.000	0.000	0.000	0.000	0.022
540	0.015	0.034	0.000	0.000	0.000	0.000	0.022
600	0.016	0.034	0.000	0.000	0.000	0.000	0.023
660	0.016	0.035	0.000	0.000	0.000	0.000	0.023
720	0.016	0.035	0.000	0.000	0.000	0.000	0.023

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/05/22 00:17:12
 Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

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state average 2020
Basin Average

Average San Diego Basin

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Methane Temperature: 65F Relative Humidity:

ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/05/22 00:17:12
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

Basin Average

Average San Diego Basin

Table 5a: Partial Day Diurnal Loss Emissions

(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:

ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
65	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/05/22 00:17:12
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual

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state average 2020

Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

Table 5b: Multi-Day Diurnal Loss Emissions

(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:
ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
65	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2012/05/22 00:17:12

Scen Year: 2020 -- All model years in the range 1976 to 2020 selected

Season : Annual

Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

Table 6a: Partial Day Resting Loss Emissions

(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:
ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
65	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU

Version : Emfac2007 V2.3 Nov 1 2006

Run Date : 2012/05/22 00:17:12

Scen Year: 2020 -- All model years in the range 1976 to 2020 selected

Season : Annual

Area : San Diego

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Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

(grams/hour) Table 6b: Multi-Day Resting Loss Emissions

Pollutant Name: Methane Temperature: ALL Relative Humidity:
 ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
65	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/05/22 00:17:12
 Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
 Season : Annual
 Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity:
 ALL

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.603	0.397	0.000	0.000	0.000	0.000	1.000
%TRIP	0.614	0.386	0.000	0.000	0.000	0.000	1.000
%VEH	0.612	0.388	0.000	0.000	0.000	0.000	1.000

Title : 2020 BAU
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2012/05/22 00:17:12
 Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
 Season : Annual

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Area : San Diego

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

Average San Diego Basin Average Basin

Table 8: Evaporative Running Loss Emissions

(grams/minute)

Pollutant Name: Methane

Temperature: 65F Relative Humidity:

ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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Areas of Expertise

- ❖ Acoustical Analysis
- ❖ Air Quality Analysis
- ❖ Greenhouse Gas

Education

B.S. Civil Engineering, San Diego State University
A.A. General Education, Palomar Community College

Prof. Registration

Engineer-In-Training (EIT)
#114983

Affiliations

- ❖ *American Society of Civil Engineers (ASCE)*
- ❖ *Institute of Noise Control Engineers (INCE)*
- ❖ *Association of Environmental Professionals (AEP)*
- ❖ *San Diego Chapter of the Building Industry Association (BIA)*
- ❖ *Approved County of San Diego CEQA Consultant for Acoustics and Air Quality*
- ❖ *American Planning Association (APA)*

Prof. History

Ldn Consulting, Inc.
Principal
2009 –Present

Urban Crossroads, Inc.
Associate Principal
2005 – 2009

Investigative Science & Engineering
Project Principal
2001-2005

City of San Marcos Engineering Division
Engineering Intern
1999-2001

Jeremy Loudon, Principal

Jeremy Loudon has been involved in the field of civil engineering for over 12 years specializing in acoustical, air quality analysis including greenhouse gas assessments. During his career, Mr. Loudon has applied both his breadth of expertise and experience in numerous projects and has worked on projects for public agencies such as the San Diego County Water Authority, Imperial Irrigation District, Caltrans, Cities throughout Southern California including, the Counties of San Diego, Riverside, San Bernardino, Los Angeles, Orange and Imperial.

Mr. Loudon has been involved in various projects involving potential impacts due to aircraft, highway, stationary sources and construction activities on humans as well as habitat and the environment. He has conducted acoustical and air toxics testing along with greenhouse gas assessments and has written compliance assessments related to all types of construction and transportation activities. Working with both public agencies and private developments, Mr. Loudon has performed the calculations and modeling of human and habitat noise impacts and required mitigation measures throughout southern California.

Mr. Loudon's technical capabilities include the use of various types of instrumentation including integrating sound level meters, air quality meters, octave band analyzers, accelerometers and long term monitoring equipment. Mr. Loudon's modeling capabilities includes the latest noise, air quality and greenhouse gas software programs and analysis procedures.

In addition, Mr. Loudon is an active participant of the San Diego County Noise Professionals working groups that are collaborating to establish guidance and thresholds on the new County Noise Ordinance, Guidelines and Element of the General Plan Update. Mr. Loudon also participates on the Technical Review Committee (TRC) for the County of San Diego's Guidelines for Determining Significance for Climate Change.