

From: [Patrick BROWN](#)
To: [Hofreiter, Larry](#)
Cc: [Boparai, Poonam](#)
Subject: RE: Rugged Solar Air Quality Study
Date: Thursday, August 23, 2012 10:41:29 AM
Attachments: [Rugged - AQ Appendix 7 18 12.pdf](#)

Larry here is appendix A. I will get the others from Mike Page. I never received these emails. Maybe you used my county email on accident Poonam?

From: Hofreiter, Larry [mailto:Larry.Hofreiter@sdcounty.ca.gov]
Sent: Thursday, August 23, 2012 10:38 AM
To: Patrick BROWN
Cc: Boparai, Poonam
Subject: FW: Rugged Solar Air Quality Study

Hey Pat,

Here are our e-mails from 8/15 and 8/17 requesting the appendices.

Thanks.

Larry Hofreiter

County of San Diego Department of Planning and Land Use
5201 Ruffin Road, Suite B, San Diego, CA 92123
Telephone: (858) 694-8846 /Fax: (858) 694-3373
Larry.Hofreiter@sdcounty.ca.gov

From: Boparai, Poonam
Sent: Friday, August 17, 2012 12:49 PM
To: Hofreiter, Larry; Brown, Patrick
Subject: RE: Rugged Solar Air Quality Study

Hi Pat,

Just following up on this request. Please send along the appendices when you can. I need those to complete my review.

Hope all is well in your new life!

Thanks,
-Poonam

From: Hofreiter, Larry
Sent: Wednesday, August 15, 2012 2:45 PM
To: Brown, Patrick
Cc: Boparai, Poonam
Subject: Rugged Solar Air Quality Study
Importance: High

Hi Pat,

Neither the Word or PDF document contains the Appendix for the Air Quality Study (See attached). Poonam had requested revisions to the Appendix, and we need to look at the Appendix to substantiate conclusions in the technical study. Can you please have Jeremy e-mail the Appendix to Poonam ASAP?

Thanks.

Larry Hofreiter

County of San Diego Department of Planning and Land Use

5201 Ruffin Road, Suite B, San Diego, CA 92123

Telephone: (858) 694-8846 /Fax: (858) 694-3373

Larry.Hofreiter@sdcounty.ca.gov

Construction

[illegible]

Operations

[illegible]

Urbemis 2007 Version 9.2.4
 Combined Summer Emissions Reports (Pounds/Day)

Project Name: Rugged - Grading - Trenching - Electrical Transmission - Tracker Installation
 Project Location: South Coast AQMD
 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>
2014 TOTALS (lbs/day unmitigated)	12.86	104.87	50.11	0.01	232.53	4.25	235.75	48.57	3.91	51.53	16,307.46
2014 TOTALS (lbs/day mitigated)	12.86	104.87	50.11	0.01	25.58	4.25	28.80	5.35	3.91	8.31	16,307.46
2015 TOTALS (lbs/day unmitigated)	11.97	94.51	48.56	0.00	0.02	3.85	3.87	0.01	3.54	3.55	16,307.43
2015 TOTALS (lbs/day mitigated)	11.97	94.51	48.56	0.00	0.02	3.85	3.87	0.01	3.54	3.55	16,307.43

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	<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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Time Slice 3/3/2014-6/30/2014 Active Days: 86	9.20	76.02	38.58	<u>0.01</u>	<u>232.53</u>	3.22	<u>235.75</u>	<u>48.57</u>	2.96	<u>51.53</u>	10,222.49
Fine Grading 03/01/2014-06/30/2014	9.20	76.02	38.58	0.01	232.53	3.22	235.75	48.57	2.96	51.53	10,222.49
Fine Grading Dust	0.00	0.00	0.00	0.00	232.48	0.00	232.48	48.55	0.00	48.55	0.00
Fine Grading Off Road Diesel	8.67	70.28	34.61	0.00	0.00	3.00	3.00	0.00	2.76	2.76	8,703.16
Fine Grading On Road Diesel	0.48	5.64	2.20	0.01	0.04	0.21	0.25	0.01	0.20	0.21	1,239.61
Fine Grading Worker Trips	0.05	0.10	1.77	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.72
Time Slice 7/1/2014-12/31/2014 Active Days: 132	<u>12.86</u>	<u>104.87</u>	<u>50.11</u>	0.00	0.02	<u>4.25</u>	4.27	0.01	<u>3.91</u>	3.92	<u>16,307.46</u>
Building 07/01/2014-08/31/2015	4.94	36.79	16.75	0.00	0.00	1.45	1.45	0.00	1.33	1.33	5,838.58
Building Off Road Diesel	4.94	36.79	16.75	0.00	0.00	1.45	1.45	0.00	1.33	1.33	5,838.58
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 07/01/2014-08/31/2015	7.92	68.08	33.36	0.00	0.02	2.80	2.82	0.01	2.58	2.58	10,468.89
Trenching Off Road Diesel	7.86	67.96	31.20	0.00	0.00	2.79	2.79	0.00	2.57	2.57	10,127.01
Trenching Worker Trips	0.06	0.12	2.16	0.00	0.02	0.01	0.03	0.01	0.01	0.01	341.88
Time Slice 1/1/2015-8/31/2015 Active Days: 173	<u>11.97</u>	<u>94.51</u>	<u>48.56</u>	<u>0.00</u>	<u>0.02</u>	<u>3.85</u>	<u>3.87</u>	<u>0.01</u>	<u>3.54</u>	<u>3.55</u>	<u>16,307.43</u>
Building 07/01/2014-08/31/2015	4.58	33.07	16.26	0.00	0.00	1.31	1.31	0.00	1.21	1.21	5,838.58
Building Off Road Diesel	4.58	33.07	16.26	0.00	0.00	1.31	1.31	0.00	1.21	1.21	5,838.58
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 07/01/2014-08/31/2015	7.39	61.43	32.30	0.00	0.02	2.54	2.56	0.01	2.34	2.34	10,468.86
Trenching Off Road Diesel	7.33	61.32	30.29	0.00	0.00	2.53	2.53	0.00	2.33	2.33	10,127.01
Trenching Worker Trips	0.06	0.11	2.01	0.00	0.02	0.01	0.03	0.01	0.01	0.01	341.85

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Phase Assumptions

Phase: Fine Grading 3/1/2014 - 6/30/2014 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 455

Maximum Daily Acreage Disturbed: 7

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 1376.93 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 292.47

Off-Road Equipment:

- 1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
- 3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
- 1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 7/1/2014 - 8/31/2015 - Default Trenching Description

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day
- 1 Generator Sets (549 hp) operating at a 0.74 load factor for 8 hours per day
- 1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 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 7/1/2014 - 8/31/2015 - Default Building Construction

Off-Road Equipment:

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- 1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day
- 2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day
- 3 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
- 2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, 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>
Time Slice 3/3/2014-6/30/2014	9.20	76.02	38.58	<u>0.01</u>	<u>25.58</u>	3.22	<u>28.80</u>	<u>5.35</u>	2.96	<u>8.31</u>	10,222.49
Active Days: 86											
Fine Grading 03/01/2014-06/30/2014	9.20	76.02	38.58	0.01	25.58	3.22	28.80	5.35	2.96	8.31	10,222.49
Fine Grading Dust	0.00	0.00	0.00	0.00	25.53	0.00	25.53	5.33	0.00	5.33	0.00
Fine Grading Off Road Diesel	8.67	70.28	34.61	0.00	0.00	3.00	3.00	0.00	2.76	2.76	8,703.16
Fine Grading On Road Diesel	0.48	5.64	2.20	0.01	0.04	0.21	0.25	0.01	0.20	0.21	1,239.61
Fine Grading Worker Trips	0.05	0.10	1.77	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.72

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Time Slice 7/1/2014-12/31/2014	<u>12.86</u>	<u>104.87</u>	<u>50.11</u>	0.00	0.02	<u>4.25</u>	4.27	0.01	<u>3.91</u>	3.92	<u>16,307.46</u>
Active Days: 132											
Building 07/01/2014-08/31/2015	4.94	36.79	16.75	0.00	0.00	1.45	1.45	0.00	1.33	1.33	5,838.58
Building Off Road Diesel	4.94	36.79	16.75	0.00	0.00	1.45	1.45	0.00	1.33	1.33	5,838.58
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 07/01/2014-08/31/2015	7.92	68.08	33.36	0.00	0.02	2.80	2.82	0.01	2.58	2.58	10,468.89
Trenching Off Road Diesel	7.86	67.96	31.20	0.00	0.00	2.79	2.79	0.00	2.57	2.57	10,127.01
Trenching Worker Trips	0.06	0.12	2.16	0.00	0.02	0.01	0.03	0.01	0.01	0.01	341.88
Time Slice 1/1/2015-8/31/2015	<u>11.97</u>	<u>94.51</u>	<u>48.56</u>	<u>0.00</u>	<u>0.02</u>	<u>3.85</u>	<u>3.87</u>	<u>0.01</u>	<u>3.54</u>	<u>3.55</u>	<u>16,307.43</u>
Active Days: 173											
Building 07/01/2014-08/31/2015	4.58	33.07	16.26	0.00	0.00	1.31	1.31	0.00	1.21	1.21	5,838.58
Building Off Road Diesel	4.58	33.07	16.26	0.00	0.00	1.31	1.31	0.00	1.21	1.21	5,838.58
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 07/01/2014-08/31/2015	7.39	61.43	32.30	0.00	0.02	2.54	2.56	0.01	2.34	2.34	10,468.86
Trenching Off Road Diesel	7.33	61.32	30.29	0.00	0.00	2.53	2.53	0.00	2.33	2.33	10,127.01
Trenching Worker Trips	0.06	0.11	2.01	0.00	0.02	0.01	0.03	0.01	0.01	0.01	341.85

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 3/1/2014 - 6/30/2014 - Default Fine Site Grading/Excavation Description

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: 55% PM25: 55%

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

PM10: 44% PM25: 44%

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

PM10: 55% PM25: 55%

Urbemis 2007 Version 9.2.4
Combined Summer Emissions Reports (Pounds/Day)

Project Name: Rugged - Building Construction
Project Location: South Coast AQMD
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>
2014 TOTALS (lbs/day unmitigated)	2.96	21.20	9.92	0.00	0.00	0.86	0.86	0.00	0.79	0.79	3,370.10
2015 TOTALS (lbs/day unmitigated)	15.32	19.12	9.73	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,388.34

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	<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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Time Slice 7/1/2014-12/31/2014	<u>2.96</u>	<u>21.20</u>	<u>9.92</u>	<u>0.00</u>	<u>0.00</u>	<u>0.86</u>	<u>0.86</u>	<u>0.00</u>	<u>0.79</u>	<u>0.79</u>	<u>3,370.10</u>
Active Days: 132											
Building 07/01/2014-03/31/2015	2.96	21.20	9.92	0.00	0.00	0.86	0.86	0.00	0.79	0.79	3,370.10
Building Off Road Diesel	2.96	21.20	9.92	0.00	0.00	0.86	0.86	0.00	0.79	0.79	3,370.10
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
Time Slice 1/1/2015-2/27/2015	2.74	19.12	9.63	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,370.10
Active Days: 42											
Building 07/01/2014-03/31/2015	2.74	19.12	9.63	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,370.10
Building Off Road Diesel	2.74	19.12	9.63	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,370.10
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
Time Slice 3/2/2015-3/31/2015	<u>15.32</u>	<u>19.12</u>	<u>9.73</u>	<u>0.00</u>	<u>0.00</u>	<u>0.77</u>	<u>0.77</u>	<u>0.00</u>	<u>0.71</u>	<u>0.71</u>	<u>3,388.34</u>
Active Days: 22											
Building 07/01/2014-03/31/2015	2.74	19.12	9.63	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,370.10
Building Off Road Diesel	2.74	19.12	9.63	0.00	0.00	0.77	0.77	0.00	0.71	0.71	3,370.10
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
Coating 03/01/2015-03/31/2015	12.58	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.24
Architectural Coating	12.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.24

Phase Assumptions

Phase: Building Construction 7/1/2014 - 3/31/2015 - Default Building Construction

Off-Road Equipment:

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

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

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- 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 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

Phase: Architectural Coating 3/1/2015 - 3/31/2015 - Type Your Description Here

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Construction Related Mitigation Measures

Road Construction Emissions Model, Version 6.3.2

Emission Estimates for -> <i>Rugged - Service & Access Roads</i>				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	3.2	14.2	27.3	1.1	1.1	-	1.0	1.0	-	3,154.3
Grading/Excavation	2.7	14.7	21.9	1.2	1.2	-	1.0	1.0	-	2,876.2
Drainage/Utilities/Sub-Grade	1.4	6.7	9.7	0.6	0.6	-	0.6	0.6	-	1,167.7
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	3.2	14.7	27.3	1.2	1.2	-	1.0	1.0	-	3,154.3
Total (tons/construction project)	0.5	2.4	3.7	0.2	0.2	-	0.2	0.2	-	483.6

Notes:	Project Start Year ->	2014
	Project Length (months) ->	18
	Total Project Area (acres) ->	162
	Maximum Area Disturbed/Day (acres) ->	7
	Total Soil Imported/Exported (yd ³ /day)->	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> <i>Rugged - Service & Access Roads</i>				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (<i>Metric Units</i>)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	1.4	6.4	12.4	0.5	0.5	-	0.5	0.5	-	1,433.8
Grading/Excavation	1.2	6.7	10.0	0.5	0.5	-	0.5	0.5	-	1,307.4
Drainage/Utilities/Sub-Grade	0.6	3.1	4.4	0.3	0.3	-	0.3	0.3	-	530.8
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	1.4	6.7	12.4	0.5	0.5	-	0.5	0.5	-	1,433.8
Total (megagrams/construction project)	0.4	2.2	3.4	0.2	0.2	-	0.2	0.2	-	438.6

Notes:	Project Start Year ->	2014
	Project Length (months) ->	18
	Total Project Area (hectares) ->	66
	Maximum Area Disturbed/Day (hectares) ->	3
	Total Soil Imported/Exported (meters ³ /day)->	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model

Version 6.3.2

Data Entry Worksheet

Note: Required data input sections have a yellow background.

Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.

The user is required to enter information in cells C10 through C25.



Input Type

Project Name	ugged - Service & Access Roads	
Construction Start Year	2014	Enter a Year between 2005 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	18.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	67	miles
Total Project Area	162.4	acres
Maximum Area Disturbed/Day	7.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported		yd ³ /day
Soil Exported		yd ³ /day
Average Truck Capacity	20.0	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

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

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of		Program
	Construction Months	Months	Calculated
Grubbing/Land Clearing	3.00	1.80	
Grading/Excavation	8.00	7.20	
Drainage/Utilities/Sub-Grade	7.00	6.30	
Paving	0.00	2.70	
Totals	18.00	18.00	

2005	%	2006	%	2007	%
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	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions		User Override of				
User Input		Soil Hauling Defaults		Default Values		
Miles/round trip				30		
Round trips/day				0		
Vehicle miles traveled/day (calculated)				0		
Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.76	9.04	4.74	0.36	0.29	1880.47
Emission rate (grams/trip)	9.63	7.32	157.57	0.01	0.01	188.75
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per construction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions		User Override of Worker				
	Commute Default Values	Default Values				
Miles/ one-way trip		20				
One-way trips/day		2				
No. of employees: Grubbing/Land Clearing	0.00	174				
No. of employees: Grading/Excavation	0.00	177				
No. of employees: Drainage/Utilities/Sub-Grade	0.00	175				
No. of employees: Paving	0.00	176				
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.104	0.189	1.990	0.033	0.018	426.680
Emission rate - Grading/Excavation (grams/mile)	0.104	0.189	1.990	0.033	0.018	426.680
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.095	0.172	1.826	0.021	0.018	426.491
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.687	0.289	6.716	0.140	0.013	193.100
Emission rate - Grading/Excavation (grams/trip)	0.687	0.289	6.716	0.140	0.013	193.100
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.639	0.268	6.242	0.140	0.013	193.383
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.000	0.000	0.000	0.000	0.000	0.000

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values		
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day		
Grubbing/Land Clearing - Exhaust		2		80		
Grading/Excavation - Exhaust		2		80		
Drainage/Utilities/Subgrade		1		40		
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.76	9.04	4.74	0.36	0.29	1880.47
Emission rate - Grading/Excavation (grams/mile)	0.76	9.04	4.74	0.36	0.29	1880.47
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.70	8.17	4.26	0.32	0.26	1884.38
Pounds per day - Grubbing/Land Clearing	0.27	3.19	1.67	0.13	0.10	662.72
Tons per const. Period - Grub/Land Clear	0.02	0.28	0.15	0.01	0.01	58.32
Pound per day - Grading/Excavation	0.27	3.19	1.67	0.13	0.10	662.72
Tons per const. Period - Grading/Excavation	0.02	0.28	0.15	0.01	0.01	58.32
Pound per day - Drainage/Utilities/Subgrade	0.06	0.72	0.38	0.03	0.02	166.02
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.06	0.03	0.00	0.00	12.78

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max		Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day		Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing	0.00	7	0.0	0.0	0.0	0.0	
Fugitive Dust - Grading/Excavation	0.00	7	0.0	0.0	0.0	0.0	
Fugitive Dust - Drainage/Utilities/Subgrade	0.00	7	0.0	0.0	0.0	0.0	

Off-Road Equipment Emissions									
Grubbing/Land Clearing			Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2	Rubber Tired Dozers	2.89	12.48	24.07	0.99	0.91	2491.58	
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	3	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	134	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	
	Grubbing/Land Clearing	pounds per day	2.9	12.5	24.1	1.0	0.9	2491.6	
	Grubbing/Land Clearing	tons per phase	0.1	0.4	0.8	0.0	0.0	82.2	

Grading/Excavation	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles							
	Override of Default Number of Vehicles	Program-estimate						
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		0 Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00		2 Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		2 Graders	1.45	7.67	11.02	0.61	0.56	1295.74
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00

		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	2	Rubber Tired Loaders	1.01	5.41	7.71	0.42	0.39	917.73
0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	134	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	2.5	13.1	18.7	1.0	0.9	2213.5
	Grading	tons per phase	0.2	1.2	1.6	0.1	0.1	194.8

Drainage/Utilities/Subgrade	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.69	3.83	5.07	0.28	0.26	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	134	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Trenchers	0.63	2.51	3.89	0.33	0.30	353.84

		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	1.3	6.3	9.0	0.6	0.6	1001.7
	Drainage	tons per phase	0.1	0.5	0.7	0.0	0.0	77.1

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Override of Default Number of Vehicles	Number of Vehicles Program-estimate						
		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2 Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2 Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		3 Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	134 Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.4	2.1	3.1	0.2	0.2	354.1

Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C285 through C317, E285 through E317, and G285 through G317.

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Aerial Lifts		60		0.46		8
Air Compressors		106		0.48		8
Bore/Drill Rigs		291		0.75		8
Cement and Mortar Mixers		10		0.56		8
Concrete/Industrial Saws		19		0.73		8
Cranes		399		0.43		8
Crushing/Proc. Equipment		142		0.78		8
Excavators		168		0.57		8

Forklifts	145		0.30		8
Generator Sets	549		0.74		8
Graders	174		0.61		8
Off-Highway Tractors	267		0.65		8
Off-Highway Trucks	479		0.57		8
Other Construction Equipment	75		0.62		8
Other General Industrial Equipment	238		0.51		8
Other Material Handling Equipment	191		0.59		8
Pavers	100		0.62		8
Paving Equipment	104		0.53		8
Plate Compactors	8		0.43		8
Pressure Washers	1		0.60		8
Pumps	53		0.74		8
Rollers	95		0.56		8
Rough Terrain Forklifts	93		0.60		8
Rubber Tired Dozers	357		0.59		8
Rubber Tired Loaders	157		0.54		8
Scrapers	313		0.72		8
Signal Boards	20		0.78		8
Skid Steer Loaders	44		0.55		8
Surfacing Equipment	362		0.45		8
Sweepers/Scrubbers	91		0.68		8
Tractors/Loaders/Backhoes	108		0.55		8
Trenchers	63		0.75		8
Welders	45		0.45		8

0

END OF DATA ENTRY SHEET

On-Road Construction Emissions

Total Daily Emissions (lbs)										
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	SO _x	PM10	PM25
Tracker Mast Delivery	20	140	2,800	1,008,000	2.39	66.54	11.01	0.10	1.93	1.44
Total	20	140	2,800	1,008,000	2.39	66.54	11.01	0.10	1.93	1.44

Total Daily Emissions (lbs/day)										
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	SO _x	PM10	PM25
Worker Trips	80	20	1600	576,000	0.21	1.64	3.98	0.01	0.24	0.14

Total Daily Emissions (lbs/day)										
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	SO _x	PM10	PM25
Total										
Rugged	100	160	4,400	1,584,000	2.59	68.18	14.99	0.12	2.17	1.58

On-Road Construction Emissions

Total Emission (tons)													
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	PM10	PM25	CO ₂	CH ₄	N ₂ O	Total GHG Emissions (Metric Tons)
Tracker Mast Delivery	20	140	2,800	1,008,000	0.43	0.033	1.98	0.35	0.26	1,912	0.00565	0.00532	1,742
Total	20	140	2,800	1,008,000	0.43	0.03	1.98	0.35	0.26	1912.22	0.00565	0.00532	1741.69

Total Emission (tons)													
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	PM10	PM25	CO ₂	CH ₄	N ₂ O	Total GHG Emissions (Metric Tons)
Worker Trips	80	20	1600	576,000	0.04	0.296	0.72	0.04	0.03	223	0.0180	0.0234	210

Total Emission (tons)													
	Total Daily Round Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	PM10	PM25	CO ₂	CH ₄	N ₂ O	Total GHG Emissions (Metric Tons)
Total													
Rugged	100	160	4,400	1,584,000	0.47	0.33	2.70	0.39	0.28	2,135.27	0.02	0.03	1,951.43

Road Dust

Travel on Paved Roads:

$$E(\text{lbs/VMT}) = (k) (sL/2)^{.65} (W/3)^{1.5} - C \quad *AP-42 \text{ 12/03, 13.2.1-4 eq 1}$$

Where:

	PM10	
k =Particle Size Multiplier (lb/VMT)	0.016	*AP-42 12/03 Table 13.2.1-1; PM10 emissions; industrial roads
sL =road surface silt loading (g/m ²)	0.1	URBEMIS default
W =Vehicle Weight:	2.4	URBEMIS default
C =exhaust, break, tire wear (lb/VMT)		*AP-42 12/03 Table 13.2.1-2; PM10 emissions
	0.0016	lbs/VMT
$E(\text{ext}) = E[1 - (P/4N)]$		*AP-42 12/03 13.2.1 eq 2
Where:		
		Western Regional Climate Center (WRCC). 2012. Boulevard 2, California. Period of Record General Climate Summary - Precipitation. Available at http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1010 . Accessed July 2012
P =# days/yr with ≥ 0.01 in. precip	51	
N =number of days in averaging period	365	
	0.0016	lbs/VMT

	Miles	PM10 (pounds)	PM10 (tons)
Total Daily Mileage	4,400	6.94	
Total Mileage	1,584,000		1.25

Travel on Unpaved Roads:

Where:

	PM10	
ARB methodology (lbs/VMT)	2.0	URBEMIS default
ARB methodology (lbs/VMT)	0.9	55% reduction due to daily site watering
Total Daily Round Trips	100	Per project description
Carpool Reduction	32	Assume 85% reduction in onsite worker trips per project applicant
Average Miles per Trip	2	Estimated given the total length of the project (less than 2 miles) and limited daily disturbed acreage (7 acres)
Unpaved PM10 (pounds/day)	57.6	
Unpaved PM10 (tons/year)	6.91	

Operational Emissions

Source Description	Number	Usage Factor	Unit	Emission Factor									
				ROG	NOX	CO	SOX	PM10	PM2.5	CO2	CH4		
Pressure Washer	10	8	hrs/day	0.01	0.08	0.06	0.000	0.01	0.00	9.41	0.00		
Generators	2	1	hrs/day	0.07	0.51	0.30	0.001	0.03	0.03	60.99	0.01		

On Road Operational Emissions

Total Daily Emissions (lbs/day)													
	Total Trips	Distance	Average Daily Mileage	Total Mileage	ROG	NO _x	CO	PM10	PM25	SOx	CO2	CH ₄	N ₂ O
Worker Trips	30	20	1200	43,200	0.16	1.23	2.98	0.18	0.10	0.01	929	0.08	0.10

Total Daily Emissions (lbs/day)													
Total					ROG	NO _x	CO	PM10	PM25	SOx	CO2	CH ₄	N ₂ O
Rugged					0.16	1.23	2.98	0.18	0.10	0.01	929	0.08	0.10

Operational Emissions

Source Description	Number	Usage Factor	Unit	Total Daily Emissions (lbs/day)								Total Emission (tons)							
				ROG	NOX	CO	SOX	PM10	PM2.5	CO2	CH4	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	CH4
Pressure Washer	10	8	hrs/day	1.16	6.71	4.83	0.01	0.43	0.39	753	0.11	0.02	0.12	0.09	0.00	0.01	0.01	12.34	0.0017
Generators	2	1	hrs/day	0.14	1.02	0.59	0.00	0.06	0.05	122	0.01	0.00	0.02	0.01	0.00	0.00	0.00	2.00	0.0002
				1.30	7.72	5.42	0.01	0.49	0.45	875.07	0.12	0.02	0.14	0.10	0.00	0.01	0.01		14.38

On Road Operational Emissions

Total Emission (tons)												
	Total Trips	Distance	Average Daily Mileage	ROG	NO _x	CO	PM10	PM25	CO ₂	CH ₄	N ₂ O	Total GHG Emission s (Metric Tons)
Worker Trips	30	20	1200	0.00	0.022	0.05	0.00	0.00	16.729	0.0014	0.0018	15.73
Total Emission (tons)												
Total				ROG	NO _x	CO	PM10	PM25	CO ₂	CH ₄	N ₂ O	Total GHG Emission s (Metric Tons)
Rugged				0.00	0.02	0.05	0.00	0.00	16.73	0.00	0.00	15.73

San Diego 2014 On-Road Emission Factors

VEH	FUEL	MDLYR	SPEED	POP	VMT	TRIPS	ROG_RUNEX	CO_RUNEX	NOX_RUNE	CO2_RUNEX	PM10_Total	PM2_5_Total	SOX_RUNEX	CH4	N2O
			(Miles/hr)	(Vehicles)	(Miles/day)	(Trips/day)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)
LDA	GAS	AllMYr	AllSpeeds	1,190,441	43,614,301	7,505,911	0.05	1.44	0.15	314.02	0.05	0.02	0.00		
LDA	DSL	AllMYr	AllSpeeds	5,566	189,912	32,861	0.04	0.24	0.64	326.51	0.08	0.05	0.00		
LDT1	GAS	AllMYr	AllSpeeds	176,132	6,327,142	1,079,817	0.09	2.79	0.30	368.91	0.05	0.02	0.00		
LDT1	DSL	AllMYr	AllSpeeds	214	6,915	1,137	0.08	0.36	0.77	327.32	0.11	0.08	0.00		
LDT2	GAS	AllMYr	AllSpeeds	431,237	16,522,043	2,719,417	0.04	1.67	0.22	445.50	0.05	0.02	0.00		
LDT2	DSL	AllMYr	AllSpeeds	190	7,172	1,102	0.05	0.28	0.74	329.98	0.08	0.05	0.00		
Average							0.059	1.130	0.467	352.041	0.069	0.040	0.004	0.028	0.0369625

Source: EMFAC 2011

VEH	FUEL	MDLYR	SPEED	POP	VMT	TRIPS	ROG_RUNEX	CO_RUNEX	NOX_RUNE	CO2_RUNEX	PM10_Total	PM2_5_Total	SOX_RUNEX	CH4	N2O
			(Miles/hr)	(Vehicles)	(Miles/day)	(Trips/day)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)
T7															
tractor	DSL	AllMYr	AllSpeeds	2,770	433,679	0	0.387319091	1.7874326	10.801626	1,724.58	0.31	0.23	0.02	0.0051	0.0048

Source: EMFAC 2011

***** SCREEN3 MODEL *****

**** VERSION DATED 96043 ****

ENTER TITLE FOR THIS RUN (UP TO 79 CHARACTERS):

Rugged Solar LLC Project Construction HRA

ENTER SOURCE TYPE: P FOR POINT

F FOR FLARE

A FOR AREA

V FOR VOLUME

ALSO ENTER ANY OF THE FOLLOWING OPTIONS ON THE SAME LINE:

N - TO USE THE NON-REGULATORY BUT CONSERVATIVE BRODE 2

MIXING HEIGHT OPTION,

nn.n - TO USE AN ANEMOMETER HEIGHT OTHER THAN THE REGULATORY

(DEFAULT) 10 METER HEIGHT.

SS - TO USE A NON-REGULATORY CAVITY CALCULATION ALTERNATIVE

Example - PN 7.0 SS (entry for a point source)

ENTER SOURCE TYPE AND ANY OF THE ABOVE OPTIONS: V

ENTER EMISSION RATE (G/S): 0.0012

ENTER SOURCE RELEASE HEIGHT (M): 5

ENTER INITIAL LATERAL DIMENSION OF VOLUME SOURCE (M): 39

ENTER INITIAL VERTICAL DIMENSION OF VOLUME SOURCE (M): 1.2

ENTER RECEPTOR HEIGHT ABOVE GROUND (FOR FLAGPOLE RECEPTOR) (M): 2

ENTER URBAN/RURAL OPTION (U=URBAN, R=RURAL): R

USE SIMPLE TERRAIN SCREEN WITH TERRAIN ABOVE STACK BASE?

ENTER Y OR N:

N

ENTER CHOICE OF METEOROLOGY;

1 - FULL METEOROLOGY (ALL STABILITIES & WIND SPEEDS)

2 - INPUT SINGLE STABILITY CLASS

3 - INPUT SINGLE STABILITY CLASS AND WIND SPEED

1

USE AUTOMATED DISTANCE ARRAY? ENTER Y OR N: N

USE DISCRETE DISTANCES? ENTER Y OR N: Y

TO CEASE, ENTER A DISTANCE OF ZERO (0).

*** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST	CONC	U10M	USTK	MIX HT	PLUME	SIGMA	SIGMA
(M)	(UG/M**3)	STAB	(M/S)	(M/S)	(M)	HT (M)	Y (M) Z (M) DWASH

ENTER DISTANCE (M) (0 TO EXIT): 107

107.	1.058	5	1.0	1.0	10000.0	5.00	44.07	4.49	NO
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ENTER DISTANCE (M) (0 TO EXIT):