

Construction Emissions

Summary

Daily and annual construction emissions are summarized in the following two tables. They include off-road vehicle emissions, on-road vehicle emissions, and temporary compressor emissions. The approach used to estimate emissions for each of these categories is described in the following sections.

Construction Emissions (lbs/day)						
	ROG	NOx	CO	PM10	PM2.5	CO2
2010						
Pounds per day (unmitigated)	26.1	168.9	115.4	227.2	51.8	29,242.7
2011						
Pounds per day (unmitigated)	72.8	384.0	296.3	38.1	20.5	49,149.9
Construction Emissions (lbs/day)						
	ROG	NOx	CO	PM10	PM2.5	CO2
2010						
Pounds per day (mitigated)	26.1	122.3	115.4	29.4	10.4	29,242.7
2011						
Pounds per day (mitigated)	72.8	316.3	296.3	16.7	13.5	49,149.9

Construction Emissions (tons/year)							Metric tons
	ROG	NOx	CO	PM10	PM2.5	CO2	CO2e
2010							
Tons per year (unmitigated)	1.5	6.0	6.5	2.4	0.7	1,534.4	1,392.39
2011							
Tons per year (unmitigated)	5.3	29.2	22.3	1.5	1.3	4,006.2	3,635.38

Construction Emissions (tons/year)							Metric tons
	ROG	NOx	CO	PM10	PM2.5	CO2	CO2e
2010							
Tons per year (mitigated)	1.5	4.5	6.5	0.5	0.3	1,534.4	1,392.39
2011							
Tons per year (mitigated)	5.3	23.8	22.3	1.2	1.1	4,006.2	3,635.38

Construction Emissions

Construction emissions are the combination of emissions from off-road vehicles, on-road vehicles, and the rental compression unit. The approach used to estimate emissions from each of these three categories is described separately below.

Off-Road Construction Emissions

Assumptions

Off-road emissions were estimated using the URBEMIS2007 model. Construction phasing and off-road equipment as listed in the project description were incorporated into URBEMIS. Several of the construction phases were further subdivided into subphases. For example, Table 2-6 of the project description lists the equipment that would be used during compressor station construction. However, construction of the compressor station would first involve the site clearing subphase, followed by several other subphases, including the civil work involved with the foundation, erecting the building, mechanical work, electrical work, and site cleanup. The emissions associated with each of these subphases were estimated separately using the schedule and equipment lists shown in the table below.

Also, due to problems associated with the building construction equipment phase of URBEMIS, the trenching phase was used in lieu of the building construction phase.

Mitigated emissions include fugitive dust controls, and exhaust controls to limit PM10, PM2.5 and NOx. The emission control reductions assume 25% reduction for PM10 and PM2.5 and 30% for NOx to account for the use of Tier II construction equipment. These percentage reductions were based on an estimate of how much Tier II equipment would reduce emissions below the 2010 fleet average and were estimated using the Sacramento Metropolitan Air Quality Management District’s construction mitigation spreadsheet. These assumptions

for Tier II equipment were applied to all off-road equipment except for the 14 sideboom pipelayers that would be used during pipeline construction. Nicor has indicated that these pipelayers would not be Tier II equipment.

Phase Assumptions

Phase: Fine Grading 7/1/2010 - 7/16/2010 - Well Pad Site Prep Grading
Total Acres Disturbed: 1
Maximum Daily Acreage Disturbed: 1
Fugitive Dust Level of Detail: Default
20 lbs per acre-day
On Road Truck Travel (VMT): 0
Off-Road Equipment:
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 0.21 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Fine Grading 9/1/2010 - 9/24/2010 - Compressor Station Site Prep
Total Acres Disturbed: 11
Maximum Daily Acreage Disturbed: 11
Fugitive Dust Level of Detail: Default
20 lbs per acre-day
On Road Truck Travel (VMT): 0
Off-Road Equipment:
1 Graders (174 hp) operating at a 0.59 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 0.21 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Fine Grading 6/1/2011 - 6/10/2011 - Metering Station Grading, Site Prep and Fencing
Total Acres Disturbed: 1
Maximum Daily Acreage Disturbed: 1
Fugitive Dust Level of Detail: Default
20 lbs per acre-day

On Road Truck Travel (VMT): 0
Off-Road Equipment:
1 Graders (174 hp) operating at a 0.59 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 0.21 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Trenching 7/19/2010 - 9/17/2010 - Nine Storage Well Drilling
Off-Road Equipment:
1 Bore/Drill Rigs (540 hp) operating at a 0.43 load factor for 24 hours per day
1 Generator Sets (800 hp) operating at a 0.43 load factor for 24 hours per day
1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Trenching 7/1/2010 - 9/30/2010 - Observation Well Conversions
Off-Road Equipment:
1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day
1 Other Equipment (190 hp) operating at a 0.59 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Trenching 9/1/2010 - 11/30/2011 - Operate Temporary Compressor Unit
Off-Road Equipment:

Phase: Trenching 9/27/2010 - 12/31/2010 - Compressor Station Civil Foundations
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
1 Generator Sets (60 hp) operating at a 0.74 load factor for 8 hours per day
2 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day
2 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day
2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 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: Trenching 1/3/2011 - 3/31/2011 - Compressor Station Building/Equipment Erection
Off-Road Equipment:
2 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day
1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
1 Generator Sets (60 hp) operating at a 0.74 load factor for 8 hours per day

Phase: Trenching 4/4/2011 - 7/15/2011 - Compressor Station Mechanical
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
1 Generator Sets (60 hp) operating at a 0.74 load factor for 8 hours per day
1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
8 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Trenching 3/1/2011 - 10/28/2011 - Pipeline Construction
Off-Road Equipment:
2 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day
5 Excavators (168 hp) operating at a 0.59 load factor for 8 hours per day
1 Graders (174 hp) operating at a 0.59 load factor for 8 hours per day
14 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
7 Other General Industrial Equipment (100 hp) operating at a 0.51 load factor for 8 hours per day
4 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day
5 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 0.21 load factor for 8 hours per day
3 Trenchers (63 hp) operating at a 0.59 load factor for 8 hours per day
10 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Trenching 7/18/2011 - 10/14/2011 - Compressor Station Electrical
Off-Road Equipment:
1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day
3 Generator Sets (13.4 hp) operating at a 0.74 load factor for 8 hours per day
2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.21 load factor for 8 hours per day

Phase: Trenching 6/13/2011 - 7/8/2011 - Metering Station Civil
Off-Road Equipment:
1 Generator Sets (60 hp) operating at a 0.74 load factor for 8 hours per day
1 Other Equipment (190 hp) operating at a 0.59 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.21 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.59 load factor for 4 hours per day

Phase: Trenching 7/11/2011 - 9/2/2011 - Metering Mechanical
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day
1 Generator Sets (60 hp) operating at a 0.74 load factor for 8 hours per day
2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Trenching 9/5/2011 - 10/7/2011 - Metering Station Electrical Insulation Paint
Off-Road Equipment:
1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day
3 Generator Sets (13.4 hp) operating at a 0.74 load factor for 8 hours per day
2 Other Equipment (190 hp) operating at a 0.59 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.21 load factor for 8 hours per day

Phase: Trenching 10/10/2011 - 10/31/2011 - Metering Station Hot Tap
Off-Road Equipment:
2 Other Equipment (190 hp) operating at a 0.59 load factor for 8 hours per day
1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Modeling Results (URBEMIS Off-Road Construction, Daily)

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Tim Rimpo\Application Data\Urbemis\Version9a\Projects\Central valley Construction 071409 Tier 2 excpt sidebooms new schedule.urb924
 Project Name: Central Valley Gas Storage

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</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2010 TOTALS (lbs/day unmitigated)	14.54	155.35	57.29	0.00	220.02	5.43	225.45	45.95	4.99	50.95	16,832.82
2010 TOTALS (lbs/day mitigated)	14.54	108.81	57.29	0.00	23.55	4.07	27.62	4.92	3.75	8.67	16,832.82
2011 TOTALS (lbs/day unmitigated)	41.94	300.07	183.15	0.03	20.14	16.63	36.77	4.23	15.29	19.52	33,985.70
2011 TOTALS (lbs/day mitigated)	41.94	232.37	183.15	0.03	2.28	13.07	15.35	0.50	12.02	12.52	33,985.70

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Construction Unmitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\Tim Rimp\Application Data\Urbemis\Version9a\Projects\Central valley Construction 071409 Tier 2 excpt sidebooms new schedule.urb924

Project Name: Central Valley Gas Storage

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

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 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Time Slice 7/1/2010-7/16/2010 Active Days: 12	3.33	29.67	15.58	0.00	20.01	1.28	21.29	4.18	1.17	5.35	3,066.30
Fine Grading 07/01/2010-07/16/2010	2.28	19.59	11.08	0.00	20.01	0.87	20.87	4.18	0.80	4.98	1,806.53
Fine Grading Dust	0.00	0.00	0.00	0.00	20.00	0.00	20.00	4.18	0.00	4.18	0.00
Fine Grading Off Road Diesel	2.24	19.52	9.90	0.00	0.00	0.86	0.86	0.00	0.79	0.79	1,689.16
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/01/2010-09/30/2010	1.06	10.08	4.50	0.00	0.01	0.41	0.42	0.00	0.38	0.38	1,259.78
Trenching Off Road Diesel	1.02	10.01	3.32	0.00	0.00	0.41	0.41	0.00	0.37	0.37	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Time Slice 7/19/2010-8/31/2010 Active Days: 32	11.37	128.88	42.07	0.00	0.01	4.16	4.18	0.00	3.83	3.83	14,359.51
Trenching 07/01/2010-09/30/2010	1.06	10.08	4.50	0.00	0.01	0.41	0.42	0.00	0.38	0.38	1,259.78
Trenching Off Road Diesel	1.02	10.01	3.32	0.00	0.00	0.41	0.41	0.00	0.37	0.37	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/19/2010-09/17/2010	10.31	118.80	37.57	0.00	0.01	3.75	3.76	0.00	3.45	3.46	13,099.73
Trenching Off Road Diesel	10.28	118.74	36.39	0.00	0.00	3.75	3.75	0.00	3.45	3.45	12,982.36
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Time Slice 9/1/2010-9/17/2010 Active Days: 13	<u>14.54</u>	<u>155.35</u>	<u>57.29</u>	0.00	<u>220.02</u>	<u>5.43</u>	<u>225.45</u>	<u>45.95</u>	<u>4.99</u>	<u>50.95</u>	<u>16,832.82</u>
Fine Grading 09/01/2010-09/24/2010	3.17	26.47	15.22	0.00	220.01	1.26	221.27	45.95	1.16	47.11	2,473.31
Fine Grading Dust	0.00	0.00	0.00	0.00	220.00	0.00	220.00	45.94	0.00	45.94	0.00
Fine Grading Off Road Diesel	3.13	26.38	13.65	0.00	0.00	1.26	1.26	0.00	1.16	1.16	2,316.82
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.09	1.57	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.49
Trenching 07/01/2010-09/30/2010	1.06	10.08	4.50	0.00	0.01	0.41	0.42	0.00	0.38	0.38	1,259.78
Trenching Off Road Diesel	1.02	10.01	3.32	0.00	0.00	0.41	0.41	0.00	0.37	0.37	1,142.41

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/19/2010-09/17/2010	10.31	118.80	37.57	0.00	0.01	3.75	3.76	0.00	3.45	3.46	13,099.73
Trenching Off Road Diesel	10.28	118.74	36.39	0.00	0.00	3.75	3.75	0.00	3.45	3.45	12,982.36
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/20/2010-9/24/2010 Active Days: 5	4.23	36.55	19.72	0.00	220.01	1.68	221.69	45.95	1.54	47.49	3,733.09
Fine Grading 09/01/2010-09/24/2010	3.17	26.47	15.22	0.00	220.01	1.26	221.27	45.95	1.16	47.11	2,473.31
Fine Grading Dust	0.00	0.00	0.00	0.00	220.00	0.00	220.00	45.94	0.00	45.94	0.00
Fine Grading Off Road Diesel	3.13	26.38	13.65	0.00	0.00	1.26	1.26	0.00	1.16	1.16	2,316.82
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.09	1.57	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.49
Trenching 07/01/2010-09/30/2010	1.06	10.08	4.50	0.00	0.01	0.41	0.42	0.00	0.38	0.38	1,259.78
Trenching Off Road Diesel	1.02	10.01	3.32	0.00	0.00	0.41	0.41	0.00	0.37	0.37	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/27/2010-9/30/2010 Active Days: 4	6.53	54.25	26.04	<u>0.00</u>	0.02	2.84	2.87	0.01	2.62	2.62	5,698.18
Trenching 07/01/2010-09/30/2010	1.06	10.08	4.50	0.00	0.01	0.41	0.42	0.00	0.38	0.38	1,259.78
Trenching Off Road Diesel	1.02	10.01	3.32	0.00	0.00	0.41	0.41	0.00	0.37	0.37	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	5.48	44.18	21.54	0.00	0.02	2.43	2.45	0.01	2.24	2.24	4,438.41
Trenching Off Road Diesel	5.37	43.98	18.00	0.00	0.00	2.42	2.42	0.00	2.23	2.23	4,086.30
Trenching Worker Trips	0.10	0.20	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.01	352.11
Time Slice 10/1/2010-12/31/2010 Active Days: 66	5.48	44.18	21.54	0.00	0.02	2.43	2.45	0.01	2.24	2.24	4,438.41
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	5.48	44.18	21.54	0.00	0.02	2.43	2.45	0.01	2.24	2.24	4,438.41
Trenching Off Road Diesel	5.37	43.98	18.00	0.00	0.00	2.42	2.42	0.00	2.23	2.23	4,086.30
Trenching Worker Trips	0.10	0.20	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.01	352.11

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Time Slice 1/3/2011-2/28/2011 Active Days: 41	1.70	13.29	7.74	0.00	0.01	0.79		0.80	0.00	0.73	1,479.83
Trenching 01/03/2011-03/31/2011	1.70	13.29	7.74	0.00	0.01	0.79		0.80	0.00	0.73	1,479.83
Trenching Off Road Diesel	1.66	13.21	6.28	0.00	0.00	0.79	0.79	0.00	0.72	0.72	1,323.28
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 3/1/2011-3/31/2011 Active Days: 23	35.04	261.37	155.15	0.02	0.12	14.37		14.49	0.04	13.22	29,655.45
Trenching 01/03/2011-03/31/2011	1.70	13.29	7.74	0.00	0.01	0.79		0.80	0.00	0.73	1,479.83
Trenching Off Road Diesel	1.66	13.21	6.28	0.00	0.00	0.79	0.79	0.00	0.72	0.72	1,323.28
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58		13.69	0.04	12.49	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 4/1/2011-4/1/2011 Active Days: 1	33.33	248.08	147.41	0.02	0.11	13.58		13.69	0.04	12.49	28,175.62
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58		13.69	0.04	12.49	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 4/4/2011-5/31/2011 Active Days: 42	38.94	275.15	168.64	0.03	0.13	15.44		15.57	0.05	14.20	31,512.33
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58		13.69	0.04	12.49	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 04/04/2011-07/15/2011	5.61	27.06	21.23	0.00	0.02	1.85		1.88	0.01	1.71	3,336.71
Trenching Off Road Diesel	5.49	26.82	16.85	0.00	0.00	1.84	1.84	0.00	1.70	1.70	2,867.07
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 6/1/2011-6/10/2011 Active Days: 8	<u>41.94</u>	<u>300.07</u>	<u>183.15</u>	<u>0.03</u>	<u>20.14</u>	<u>16.63</u>		<u>36.77</u>	<u>4.23</u>	<u>15.29</u>	<u>33,985.70</u>

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>	
Fine Grading 06/01/2011-06/10/2011	3.00	24.92	14.50	0.00		20.01	1.19	21.20	4.18	1.10	5.28	2,473.37
Fine Grading Dust	0.00	0.00	0.00	0.00	20.00	0.00	20.00	4.18	0.00	4.18	0.00	
Fine Grading Off Road Diesel	2.96	24.84	13.04	0.00	0.00	1.19	1.19	0.00	1.09	1.09	2,316.82	
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fine Grading Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55	
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02		0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94	
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68	
Trenching 04/04/2011-07/15/2011	5.61	27.06	21.23	0.00		0.02	1.85	1.88	0.01	1.71	1.71	3,336.71
Trenching Off Road Diesel	5.49	26.82	16.85	0.00	0.00	1.84	1.84	0.00	1.70	1.70	2,867.07	
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65	
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 6/13/2011-7/8/2011 Active Days: 20	40.45	287.90	175.43	0.03		0.14	16.10	16.24	0.05	14.81	14.86	33,138.39
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02		0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94	
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68	
Trenching 04/04/2011-07/15/2011	5.61	27.06	21.23	0.00		0.02	1.85	1.88	0.01	1.71	1.71	3,336.71
Trenching Off Road Diesel	5.49	26.82	16.85	0.00	0.00	1.84	1.84	0.00	1.70	1.70	2,867.07	
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65	
Trenching 06/13/2011-07/08/2011	1.51	12.75	6.79	0.00		0.01	0.67	0.67	0.00	0.61	0.61	1,626.05
Trenching Off Road Diesel	1.47	12.67	5.33	0.00	0.00	0.66	0.66	0.00	0.61	0.61	1,469.50	
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55	
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Time Slice 7/11/2011-7/15/2011 Active Days: 5	41.02	287.49	176.78	0.03		0.14	16.19	16.33	0.05	14.89	14.94	32,920.33
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02		0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94	
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68	
Trenching 04/04/2011-07/15/2011	5.61	27.06	21.23	0.00		0.02	1.85	1.88	0.01	1.71	1.71	3,336.71
Trenching Off Road Diesel	5.49	26.82	16.85	0.00	0.00	1.84	1.84	0.00	1.70	1.70	2,867.07	
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65	
Trenching 07/11/2011-09/02/2011	2.08	12.34	8.14	0.00		0.01	0.76	0.77	0.00	0.70	0.70	1,407.99
Trenching Off Road Diesel	2.03	12.26	6.68	0.00	0.00	0.75	0.75	0.00	0.69	0.69	1,251.45	

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 7/18/2011-9/2/2011 Active Days: 35	37.44	277.58	165.51	0.03	0.13	15.20	15.33	0.05	13.98	14.03	31,912.12
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/11/2011-09/02/2011	2.08	12.34	8.14	0.00	0.01	0.76	0.77	0.00	0.70	0.70	1,407.99
Trenching Off Road Diesel	2.03	12.26	6.68	0.00	0.00	0.75	0.75	0.00	0.69	0.69	1,251.45
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 07/18/2011-10/14/2011	2.03	17.15	9.96	0.00	0.01	0.87	0.88	0.00	0.80	0.80	2,328.50
Trenching Off Road Diesel	1.96	17.01	7.40	0.00	0.00	0.86	0.86	0.00	0.79	0.79	2,054.54
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/5/2011-10/7/2011 Active Days: 25	37.35	281.88	167.17	0.03	0.14	15.30	15.43	0.05	14.07	14.12	32,761.79
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/18/2011-10/14/2011	2.03	17.15	9.96	0.00	0.01	0.87	0.88	0.00	0.80	0.80	2,328.50
Trenching Off Road Diesel	1.96	17.01	7.40	0.00	0.00	0.86	0.86	0.00	0.79	0.79	2,054.54
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/05/2011-10/07/2011	1.98	16.65	9.80	0.00	0.01	0.85	0.86	0.00	0.78	0.79	2,257.66
Trenching Off Road Diesel	1.91	16.51	7.25	0.00	0.00	0.84	0.84	0.00	0.78	0.78	1,983.70
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Time Slice 10/10/2011-10/14/2011 Active Days: 5	38.11	283.74	168.90	0.03	0.13	15.53	15.66	0.05	14.28	14.33	32,933.21
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/18/2011-10/14/2011	2.03	17.15	9.96	0.00	0.01	0.87	0.88	0.00	0.80	0.80	2,328.50
Trenching Off Road Diesel	1.96	17.01	7.40	0.00	0.00	0.86	0.86	0.00	0.79	0.79	2,054.54

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	18.51	11.53	0.00	0.01	1.08	1.09	0.00	0.99	1.00	2,429.09
Trenching Off Road Diesel	2.69	18.38	9.34	0.00	0.00	1.07	1.07	0.00	0.99	0.99	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 10/17/2011-10/28/2011 Active Days: 10	36.08	266.59	158.94	0.02	0.12	14.66	14.78	0.04	13.48	13.53	30,604.71
Trenching 03/01/2011-10/28/2011	33.33	248.08	147.41	0.02	0.11	13.58	13.69	0.04	12.49	12.53	28,175.62
Trenching Off Road Diesel	32.76	246.95	126.97	0.00	0.00	13.52	13.52	0.00	12.44	12.44	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	18.51	11.53	0.00	0.01	1.08	1.09	0.00	0.99	1.00	2,429.09
Trenching Off Road Diesel	2.69	18.38	9.34	0.00	0.00	1.07	1.07	0.00	0.99	0.99	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 10/31/2011-10/31/2011 Active Days: 1	2.75	18.51	11.53	0.00	0.01	1.08	1.09	0.00	0.99	1.00	2,429.09
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	18.51	11.53	0.00	0.01	1.08	1.09	0.00	0.99	1.00	2,429.09
Trenching Off Road Diesel	2.69	18.38	9.34	0.00	0.00	1.07	1.07	0.00	0.99	0.99	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 11/1/2011-11/30/2011 Active Days: 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

File Name: C:\Documents and Settings\Tim Rimp\Application Data\Urbemis\Version9a\Projects\Central valley
 Construction 071409 Tier 2 excpt sidebooms new schedule.urb924
 Project Name: Central Valley Gas Storage

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

CONSTRUCTION EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Time Slice 7/1/2010- 7/16/2010 Active Days: 12	3.33	20.81	15.58	0.00	2.15	0.96	3.11	0.45	0.88	1.33	3,066.30
Fine Grading 07/01/2010- 07/16/2010	2.28	13.73	11.08	0.00	2.14	0.65	2.80	0.45	0.60	1.05	1,806.53
Fine Grading Dust	0.00	0.00	0.00	0.00	2.14	0.00	2.14	0.45	0.00	0.45	0.00
Fine Grading Off Road Diesel	2.24	13.67	9.90	0.00	0.00	0.65	0.65	0.00	0.60	0.60	1,689.16
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/01/2010- 09/30/2010	1.06	7.07	4.50	0.00	0.01	0.31	0.31	0.00	0.28	0.29	1,259.78
Trenching Off Road Diesel	1.02	7.01	3.32	0.00	0.00	0.31	0.31	0.00	0.28	0.28	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Time Slice 7/19/2010- 8/31/2010 Active Days: 32	11.37	90.25	42.07	0.00	0.01	3.12	3.14	0.00	2.87	2.88	14,359.51
Trenching 07/01/2010- 09/30/2010	1.06	7.07	4.50	0.00	0.01	0.31	0.31	0.00	0.28	0.29	1,259.78
Trenching Off Road Diesel	1.02	7.01	3.32	0.00	0.00	0.31	0.31	0.00	0.28	0.28	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/19/2010- 09/17/2010	10.31	83.18	37.57	0.00	0.01	2.82	2.82	0.00	2.59	2.59	13,099.73
Trenching Off Road Diesel	10.28	83.12	36.39	0.00	0.00	2.81	2.81	0.00	2.59	2.59	12,982.36
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Time Slice 9/1/2010- 9/17/2010 Active Days: 13	<u>14.54</u>	<u>108.81</u>	<u>57.29</u>	0.00	<u>23.55</u>	<u>4.07</u>	<u>27.62</u>	<u>4.92</u>	<u>3.75</u>	<u>8.67</u>	<u>16,832.82</u>
Fine Grading 09/01/2010- 09/24/2010	3.17	18.55	15.22	0.00	23.54	0.95	24.49	4.92	0.87	5.79	2,473.31
Fine Grading Dust	0.00	0.00	0.00	0.00	23.53	0.00	23.53	4.91	0.00	4.91	0.00

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Fine Grading Off Road Diesel	3.13	18.47	13.65	0.00	0.00	0.95	0.95	0.00	0.87	0.87	2,316.82
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.09	1.57	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.49
Trenching 07/01/2010-09/30/2010	1.06	7.07	4.50	0.00	0.01	0.31	0.31	0.00	0.28	0.29	1,259.78
Trenching Off Road Diesel	1.02	7.01	3.32	0.00	0.00	0.31	0.31	0.00	0.28	0.28	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 07/19/2010-09/17/2010	10.31	83.18	37.57	0.00	0.01	2.82	2.82	0.00	2.59	2.59	13,099.73
Trenching Off Road Diesel	10.28	83.12	36.39	0.00	0.00	2.81	2.81	0.00	2.59	2.59	12,982.36
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/20/2010-9/24/2010 Active Days: 5	4.23	25.63	19.72	0.00	23.54	1.26	24.80	4.92	1.16	6.08	3,733.09
Fine Grading 09/01/2010-09/24/2010	3.17	18.55	15.22	0.00	23.54	0.95	24.49	4.92	0.87	5.79	2,473.31
Fine Grading Dust	0.00	0.00	0.00	0.00	23.53	0.00	23.53	4.91	0.00	4.91	0.00
Fine Grading Off Road Diesel	3.13	18.47	13.65	0.00	0.00	0.95	0.95	0.00	0.87	0.87	2,316.82
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.09	1.57	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.49
Trenching 07/01/2010-09/30/2010	1.06	7.07	4.50	0.00	0.01	0.31	0.31	0.00	0.28	0.29	1,259.78
Trenching Off Road Diesel	1.02	7.01	3.32	0.00	0.00	0.31	0.31	0.00	0.28	0.28	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/27/2010-9/30/2010 Active Days: 4	6.53	38.06	26.04	<u>0.00</u>	0.02	2.14	2.16	0.01	1.96	1.97	5,698.18
Trenching 07/01/2010-09/30/2010	1.06	7.07	4.50	0.00	0.01	0.31	0.31	0.00	0.28	0.29	1,259.78

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Trenching Off Road Diesel	1.02	7.01	3.32	0.00	0.00	0.31	0.31	0.00	0.28	0.28	1,142.41
Trenching Worker Trips	0.03	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.00	117.37
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	5.48	30.98	21.54	0.00	0.02	1.83	1.85	0.01	1.68	1.69	4,438.41
Trenching Off Road Diesel	5.37	30.79	18.00	0.00	0.00	1.82	1.82	0.00	1.67	1.67	4,086.30
Trenching Worker Trips	0.10	0.20	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.01	352.11
Time Slice 10/1/2010-12/31/2010 Active Days: 66	5.48	30.98	21.54	0.00	0.02	1.83	1.85	0.01	1.68	1.69	4,438.41
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	5.48	30.98	21.54	0.00	0.02	1.83	1.85	0.01	1.68	1.69	4,438.41
Trenching Off Road Diesel	5.37	30.79	18.00	0.00	0.00	1.82	1.82	0.00	1.67	1.67	4,086.30
Trenching Worker Trips	0.10	0.20	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.01	352.11
Time Slice 1/3/2011-2/28/2011 Active Days: 41	1.70	9.33	7.74	0.00	0.01	0.59	0.60	0.00	0.55	0.55	1,479.83
Trenching 01/03/2011-03/31/2011	1.70	9.33	7.74	0.00	0.01	0.59	0.60	0.00	0.55	0.55	1,479.83
Trenching Off Road Diesel	1.66	9.25	6.28	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,323.28
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 3/1/2011-3/31/2011 Active Days: 23	35.04	205.21	155.15	0.02	0.12	11.37	11.49	0.04	10.46	10.50	29,655.45
Trenching 01/03/2011-03/31/2011	1.70	9.33	7.74	0.00	0.01	0.59	0.60	0.00	0.55	0.55	1,479.83
Trenching Off Road Diesel	1.66	9.25	6.28	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,323.28
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 4/1/2011-4/1/2011 Active Days: 1	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 4/4/2011-5/31/2011 Active Days: 42	38.94	214.90	168.64	0.03	0.13	12.17	12.31	0.05	11.20	11.24	31,512.33
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 04/04/2011-07/15/2011	5.61	19.02	21.23	0.00	0.02	1.39	1.42	0.01	1.28	1.29	3,336.71
Trenching Off Road Diesel	5.49	18.78	16.85	0.00	0.00	1.38	1.38	0.00	1.27	1.27	2,867.07
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 6/1/2011-6/10/2011 Active Days: 8	41.94	232.37	183.15	0.03	2.28	13.07	15.35	0.50	12.02	12.52	33,985.70
Fine Grading 06/01/2011-06/10/2011	3.00	17.47	14.50	0.00	2.15	0.89	3.04	0.45	0.82	1.27	2,473.37
Fine Grading Dust	0.00	0.00	0.00	0.00	2.14	0.00	2.14	0.45	0.00	0.45	0.00

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Fine Grading Off Road Diesel	2.96	17.39	13.04	0.00	0.00	0.89	0.89	0.00	0.82	0.82	2,316.82
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 04/04/2011-07/15/2011	5.61	19.02	21.23	0.00	0.02	1.39	1.42	0.01	1.28	1.29	3,336.71
Trenching Off Road Diesel	5.49	18.78	16.85	0.00	0.00	1.38	1.38	0.00	1.27	1.27	2,867.07
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 6/13/2011-7/8/2011 Active Days: 20	40.45	223.85	175.43	0.03	0.14	12.68	12.82	0.05	11.66	11.71	33,138.39
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 04/04/2011-07/15/2011	5.61	19.02	21.23	0.00	0.02	1.39	1.42	0.01	1.28	1.29	3,336.71
Trenching Off Road Diesel	5.49	18.78	16.85	0.00	0.00	1.38	1.38	0.00	1.27	1.27	2,867.07
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65
Trenching 06/13/2011-07/08/2011	1.51	8.95	6.79	0.00	0.01	0.50	0.51	0.00	0.46	0.46	1,626.05
Trenching Off Road Diesel	1.47	8.87	5.33	0.00	0.00	0.50	0.50	0.00	0.46	0.46	1,469.50
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 7/11/2011-7/15/2011 Active Days: 5	41.02	223.56	176.78	0.03	0.14	12.74	12.88	0.05	11.72	11.77	32,920.33

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 04/04/2011-07/15/2011	5.61	19.02	21.23	0.00	0.02	1.39	1.42	0.01	1.28	1.29	3,336.71
Trenching Off Road Diesel	5.49	18.78	16.85	0.00	0.00	1.38	1.38	0.00	1.27	1.27	2,867.07
Trenching Worker Trips	0.12	0.24	4.38	0.00	0.02	0.01	0.04	0.01	0.01	0.02	469.65
Trenching 07/11/2011-09/02/2011	2.08	8.66	8.14	0.00	0.01	0.57	0.58	0.00	0.52	0.53	1,407.99
Trenching Off Road Diesel	2.03	8.58	6.68	0.00	0.00	0.57	0.57	0.00	0.52	0.52	1,251.45
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 7/18/2011-9/2/2011 Active Days: 35	37.44	216.59	165.51	0.03	0.13	12.00	12.13	0.05	11.04	11.08	31,912.12
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/11/2011-09/02/2011	2.08	8.66	8.14	0.00	0.01	0.57	0.58	0.00	0.52	0.53	1,407.99
Trenching Off Road Diesel	2.03	8.58	6.68	0.00	0.00	0.57	0.57	0.00	0.52	0.52	1,251.45
Trenching Worker Trips	0.04	0.08	1.46	0.00	0.01	0.00	0.01	0.00	0.00	0.01	156.55
Trenching 07/18/2011-10/14/2011	2.03	12.05	9.96	0.00	0.01	0.65	0.66	0.00	0.60	0.60	2,328.50
Trenching Off Road Diesel	1.96	11.91	7.40	0.00	0.00	0.64	0.64	0.00	0.59	0.59	2,054.54
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 9/5/2011-10/7/2011 Active Days: 25	37.35	219.63	167.17	0.03	0.14	12.07	12.21	0.05	11.10	11.15	32,761.79

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/18/2011-10/14/2011	2.03	12.05	9.96	0.00	0.01	0.65	0.66	0.00	0.60	0.60	2,328.50
Trenching Off Road Diesel	1.96	11.91	7.40	0.00	0.00	0.64	0.64	0.00	0.59	0.59	2,054.54
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/05/2011-10/07/2011	1.98	11.70	9.80	0.00	0.01	0.64	0.65	0.00	0.59	0.59	2,257.66
Trenching Off Road Diesel	1.91	11.55	7.25	0.00	0.00	0.63	0.63	0.00	0.58	0.58	1,983.70
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Time Slice 10/10/2011-10/14/2011 Active Days: 5	38.11	220.92	168.90	0.03	0.13	12.24	12.38	0.05	11.26	11.31	32,933.21
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 07/18/2011-10/14/2011	2.03	12.05	9.96	0.00	0.01	0.65	0.66	0.00	0.60	0.60	2,328.50
Trenching Off Road Diesel	1.96	11.91	7.40	0.00	0.00	0.64	0.64	0.00	0.59	0.59	2,054.54
Trenching Worker Trips	0.07	0.14	2.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	273.96
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	12.99	11.53	0.00	0.01	0.81	0.82	0.00	0.75	0.75	2,429.09
Trenching Off Road Diesel	2.69	12.87	9.34	0.00	0.00	0.81	0.81	0.00	0.74	0.74	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 10/17/2011-10/28/2011 Active Days: 10	36.08	208.87	158.94	0.02	0.12	11.59	11.71	0.04	10.66	10.70	30,604.71

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
Trenching 03/01/2011-10/28/2011	33.33	195.88	147.41	0.02	0.11	10.78	10.89	0.04	9.91	9.95	28,175.62
Trenching Off Road Diesel	32.76	194.75	126.97	0.00	0.00	10.72	10.72	0.00	9.87	9.87	25,983.94
Trenching Worker Trips	0.57	1.13	20.44	0.02	0.11	0.06	0.17	0.04	0.05	0.09	2,191.68
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	12.99	11.53	0.00	0.01	0.81	0.82	0.00	0.75	0.75	2,429.09
Trenching Off Road Diesel	2.69	12.87	9.34	0.00	0.00	0.81	0.81	0.00	0.74	0.74	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 10/31/2011-10/31/2011 Active Days: 1	2.75	12.99	11.53	0.00	0.01	0.81	0.82	0.00	0.75	0.75	2,429.09
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 10/10/2011-10/31/2011	2.75	12.99	11.53	0.00	0.01	0.81	0.82	0.00	0.75	0.75	2,429.09
Trenching Off Road Diesel	2.69	12.87	9.34	0.00	0.00	0.81	0.81	0.00	0.74	0.74	2,194.26
Trenching Worker Trips	0.06	0.12	2.19	0.00	0.01	0.01	0.02	0.00	0.01	0.01	234.82
Time Slice 11/1/2011-11/30/2011 Active Days: 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 7/1/2010 - 7/16/2010 - Well Pad Site Prep 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 Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Fine Grading 9/1/2010 - 9/24/2010 - Compressor Station Site Prep

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

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Fine Grading 6/1/2011 - 6/10/2011 - Metering Station Grading, Site Prep and Fencing

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

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/1/2010 - 9/30/2010 - Observation Well Conversions

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Aerial Lifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/19/2010 - 9/17/2010 - Nine Storage Well Drilling

For Bore/Drill Rigs, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 9/27/2010 - 12/31/2010 - Compressor Station

Civil Foundations

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other General Industrial Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 1/3/2011 - 3/31/2011 - Compressor Station Building/Equipment Erection

For Aerial Lifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Aerial Lifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 3/1/2011 - 10/28/2011 - Pipeline Construction

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Trenchers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Trenchers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Excavators, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Excavators, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other General Industrial Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 4/4/2011 - 7/15/2011 - Compressor Station
Mechanical

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rough Terrain Forklifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 6/13/2011 - 7/8/2011 - Metering Station Civil

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/11/2011 - 9/2/2011 - Metering Mechanical

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/18/2011 - 10/14/2011 - Compressor Station Electrical

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 9/5/2011 - 10/7/2011 - Metering Station
Electrical Insulation Paint

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 10/10/2011 - 10/31/2011 - Metering Station Hot
Tap

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

Modeling Results (URBEMIS Off-Road Construction, Annual)

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\Tim Rimpo\Application Data\Urbemis\Version9a\Projects\Central valley Construction 071409 Tier 2
 excpt sidebooms new schedule.urb924

Project Name: Central Valley Gas Storage

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

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>
2010 TOTALS (tons/year unmitigated)	0.50	4.91	1.95	0.00	2.10	0.20	2.30	0.44	0.18	0.62	524.76
2010 TOTALS (tons/year mitigated)	0.50	3.44	1.95	0.00	0.23	0.15	0.38	0.05	0.14	0.19	524.76
Percent Reduction	0.00	29.93	0.00	0.00	89.26	24.93	83.67	89.23	24.94	70.26	0.00
2011 TOTALS (tons/year unmitigated)	3.35	24.41	14.70	0.00	0.09	1.35	1.44	0.02	1.24	1.26	2,801.40
2011 TOTALS (tons/year mitigated)	3.35	19.03	14.70	0.00	0.02	1.06	1.08	0.01	0.98	0.99	2,801.40
Percent Reduction	0.00	22.05	0.00	0.00	78.03	21.14	24.76	71.47	21.15	21.98	0.00

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Unmitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\Tim Rimpo\Application Data\Urbemis\Version9a\Projects\Central valley Construction 071409 Tier 2 excpt sidebooms new schedule.urb924

Project Name: Central Valley Gas Storage

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

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u> <u>Dust</u>	<u>PM10</u> <u>Exhaust</u>	<u>PM10</u> <u>Total</u>	<u>PM2.5</u> <u>Dust</u>	<u>PM2.5</u> <u>Exhaust</u>	<u>PM2.5</u> <u>Total</u>	<u>CO2</u>
2010	0.50	4.91	1.95	0.00	2.10	0.20	2.30	0.44	0.18	0.62	524.76
Fine Grading	0.01	0.12	0.07	0.00	0.12	0.01	0.13	0.03	0.00	0.03	10.84
07/01/2010-07/16/2010											
Fine Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.03	0.00	0.03	0.00
Fine Grading Off Road Diesel	0.01	0.12	0.06	0.00	0.00	0.01	0.01	0.00	0.00	0.00	10.13
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Trenching 07/01/2010-09/30/2010	0.03	0.33	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	41.57
Trenching Off Road Diesel	0.03	0.33	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	37.70
Trenching Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.87
Trenching 07/19/2010-09/17/2010	0.23	2.67	0.85	0.00	0.00	0.08	0.08	0.00	0.08	0.08	294.74
Trenching Off Road Diesel	0.23	2.67	0.82	0.00	0.00	0.08	0.08	0.00	0.08	0.08	292.10
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64
Fine Grading	0.03	0.24	0.14	0.00	1.98	0.01	1.99	0.41	0.01	0.42	22.26
09/01/2010-09/24/2010											
Fine Grading Dust	0.00	0.00	0.00	0.00	1.98	0.00	1.98	0.41	0.00	0.41	0.00
Fine Grading Off Road Diesel	0.03	0.24	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.85
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	0.19	1.55	0.75	0.00	0.00	0.09	0.09	0.00	0.08	0.08	155.34
Trenching Off Road Diesel	0.19	1.54	0.63	0.00	0.00	0.08	0.08	0.00	0.08	0.08	143.02

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM10</u>	<u>PM10</u>	<u>PM2.5</u>	<u>PM2.5</u>	<u>PM2.5</u>	<u>CO2</u>
					<u>Dust</u>	<u>Exhaust</u>	<u>Total</u>	<u>Dust</u>	<u>Exhaust</u>	<u>Total</u>	
Trenching Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.32
2011	3.35	24.41	14.70	0.00	0.09	1.35	1.44	0.02	1.24	1.26	2,801.40
Trenching 01/03/2011-03/31/2011	0.05	0.43	0.25	0.00	0.00	0.03	0.03	0.00	0.02	0.02	47.35
Trenching Off Road Diesel	0.05	0.42	0.20	0.00	0.00	0.03	0.03	0.00	0.02	0.02	42.35
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.01
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 03/01/2011-10/28/2011	2.90	21.58	12.82	0.00	0.01	1.18	1.19	0.00	1.09	1.09	2,451.28
Trenching Off Road Diesel	2.85	21.49	11.05	0.00	0.00	1.18	1.18	0.00	1.08	1.08	2,260.60
Trenching Worker Trips	0.05	0.10	1.78	0.00	0.01	0.00	0.01	0.00	0.00	0.01	190.68
Trenching 04/04/2011-07/15/2011	0.21	1.01	0.80	0.00	0.00	0.07	0.07	0.00	0.06	0.06	125.13
Trenching Off Road Diesel	0.21	1.01	0.63	0.00	0.00	0.07	0.07	0.00	0.06	0.06	107.51
Trenching Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.61
Fine Grading	0.01	0.10	0.06	0.00	0.08	0.00	0.08	0.02	0.00	0.02	9.89
06/01/2011-06/10/2011											
Fine Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Fine Grading Off Road Diesel	0.01	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.27
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
Trenching 06/13/2011-07/08/2011	0.02	0.13	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	16.26
Trenching Off Road Diesel	0.01	0.13	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.70
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
Trenching 07/11/2011-09/02/2011	0.04	0.25	0.16	0.00	0.00	0.02	0.02	0.00	0.01	0.01	28.16
Trenching Off Road Diesel	0.04	0.25	0.13	0.00	0.00	0.02	0.02	0.00	0.01	0.01	25.03
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13
Trenching 07/18/2011-10/14/2011	0.07	0.56	0.32	0.00	0.00	0.03	0.03	0.00	0.03	0.03	75.68
Trenching Off Road Diesel	0.06	0.55	0.24	0.00	0.00	0.03	0.03	0.00	0.03	0.03	66.77

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Diesel											
Trenching Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.90
Trenching 09/05/2011-10/07/2011	0.02	0.21	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.22
Trenching Off Road Diesel	0.02	0.21	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	24.80
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42
Trenching 10/10/2011-10/31/2011	0.02	0.15	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.43
Trenching Off Road Diesel	0.02	0.15	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	17.55
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Mitigated Emissions (Tons/Year)

File Name: C:\Documents and Settings\Tim Rimp\Application Data\Urbemis\Version9a\Projects\Central valley Construction 071409 Tier 2 excpt sidebooms new schedule.urb924
 Project Name: Central Valley Gas Storage

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

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 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
2010	0.50	3.44	1.95	0.00	0.23	0.15	0.38	0.05	0.14	0.19	524.76
Fine Grading 07/01/2010-07/16/2010	0.01	0.08	0.07	0.00	0.01	0.00	0.02	0.00	0.00	0.01	10.84
Fine Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.01	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Trenching 07/01/2010-	0.03	0.23	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	41.57

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
09/30/2010											
Trenching Off Road Diesel	0.03	0.23	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	37.70
Trenching Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.87
Trenching 07/19/2010-09/17/2010	0.23	1.87	0.85	0.00	0.00	0.06	0.06	0.00	0.06	0.06	294.74
Trenching Off Road Diesel	0.23	1.87	0.82	0.00	0.00	0.06	0.06	0.00	0.06	0.06	292.10
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64
Fine Grading 09/01/2010-09/24/2010	0.03	0.17	0.14	0.00	0.21	0.01	0.22	0.04	0.01	0.05	22.26
Fine Grading Dust	0.00	0.00	0.00	0.00	0.21	0.00	0.21	0.04	0.00	0.04	0.00
Fine Grading Off Road Diesel	0.03	0.17	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.85
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 09/27/2010-12/31/2010	0.19	1.08	0.75	0.00	0.00	0.06	0.06	0.00	0.06	0.06	155.34
Trenching Off Road Diesel	0.19	1.08	0.63	0.00	0.00	0.06	0.06	0.00	0.06	0.06	143.02
Trenching Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.32
2011	3.35	19.03	14.70	0.00	0.02	1.06	1.08	0.01	0.98	0.99	2,801.40
Trenching 01/03/2011-03/31/2011	0.05	0.30	0.25	0.00	0.00	0.02	0.02	0.00	0.02	0.02	47.35
Trenching Off Road Diesel	0.05	0.30	0.20	0.00	0.00	0.02	0.02	0.00	0.02	0.02	42.35
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.01
Trenching 09/01/2010-11/30/2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 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 03/01/2011-10/28/2011	2.90	17.04	12.82	0.00	0.01	0.94	0.95	0.00	0.86	0.87	2,451.28
Trenching Off Road Diesel	2.85	16.94	11.05	0.00	0.00	0.93	0.93	0.00	0.86	0.86	2,260.60
Trenching Worker Trips	0.05	0.10	1.78	0.00	0.01	0.00	0.01	0.00	0.00	0.01	190.68

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10 Total</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5 Total</u>	<u>CO2</u>
Trenching 04/04/2011- 07/15/2011	0.21	0.71	0.80	0.00	0.00	0.05	0.05	0.00	0.05	0.05	125.13
Trenching Off Road Diesel	0.21	0.70	0.63	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.51
Trenching Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.61
Fine Grading 06/01/2011- 06/10/2011	0.01	0.07	0.06	0.00	0.01	0.00	0.01	0.00	0.00	0.01	9.89
Fine Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.01	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.27
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
Trenching 06/13/2011- 07/08/2011	0.02	0.09	0.07	0.00	0.00	0.01	0.01	0.00	0.00	0.00	16.26
Trenching Off Road Diesel	0.01	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.70
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
Trenching 07/11/2011- 09/02/2011	0.04	0.17	0.16	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.16
Trenching Off Road Diesel	0.04	0.17	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	25.03
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13
Trenching 07/18/2011- 10/14/2011	0.07	0.39	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	75.68
Trenching Off Road Diesel	0.06	0.39	0.24	0.00	0.00	0.02	0.02	0.00	0.02	0.02	66.77
Trenching Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.90
Trenching 09/05/2011- 10/07/2011	0.02	0.15	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.22
Trenching Off Road Diesel	0.02	0.14	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	24.80
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42
Trenching 10/10/2011- 10/31/2011	0.02	0.10	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.43
Trenching Off Road Diesel	0.02	0.10	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	17.55
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 7/1/2010 - 7/16/2010 - Well Pad Site Prep 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 Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Fine Grading 9/1/2010 - 9/24/2010 - Compressor Station Site Prep

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

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Fine Grading 6/1/2011 - 6/10/2011 - Metering Station Grading, Site Prep and Fencing

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

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

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

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/1/2010 - 9/30/2010 - Observation Well Conversions

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Aerial Lifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/19/2010 - 9/17/2010 - Nine Storage Well Drilling

For Bore/Drill Rigs, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 9/27/2010 - 12/31/2010 - Compressor Station Civil Foundations

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other General Industrial Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 1/3/2011 - 3/31/2011 - Compressor Station Building/Equipment Erection

For Aerial Lifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Aerial Lifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 3/1/2011 - 10/28/2011 - Pipeline Construction

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Trenchers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Trenchers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Excavators, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Excavators, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other General Industrial Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 4/4/2011 - 7/15/2011 - Compressor Station
Mechanical

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Rough Terrain Forklifts, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rough Terrain Forklifts, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 6/13/2011 - 7/8/2011 - Metering Station Civil

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/11/2011 - 9/2/2011 - Metering Mechanical

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Cranes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Cranes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 7/18/2011 - 10/14/2011 - Compressor Station
Electrical

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 9/5/2011 - 10/7/2011 - Metering Station Electrical Insulation Paint

For Air Compressors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Air Compressors, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Generator Sets, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Generator Sets, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

The following mitigation measures apply to Phase: Trenching 10/10/2011 - 10/31/2011 - Metering Station Hot Tap

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Welders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Welders, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Other Equipment, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Other Equipment, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

For Pumps, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pumps, the Diesel Oxidation Catalyst 30% mitigation reduces emissions by:

NOX: 30%

On-Road Construction Emissions

On-road construction emissions, summarized in the following table, were estimated using the following approach. First, the on-road vehicles associated with each construction phase were identified from the construction equipment list found in Table 2-5. Miles per day per vehicle and total vehicle miles per day (VMT) traveled were estimated for each vehicle class. Then, emissions (in pounds per day) were estimated for each vehicle class by multiplying VMT by the appropriate emission rates. The emissions rates were based on EMFAC2007 modeling runs shown in the tables that follow.

The maximum pounds per day estimates for each year were based on the total ppd for each phase occurring in each year. Maximum tons for each year were estimated by multiplying maximum pounds per day for each phase by the length of each phase that occurs in that particular year, and adding the total over all phases that occur in a year.

		ROG	NOx	CO	PM10	PM2.5	CO2
Max 2010	ppd->	2.90	9.54	24.10	0.94	0.83	2452.03
Max 2011	ppd->	22.21	79.99	79.13	0.45	0.14	5206.36
Max 2010	tpy->	0.22	0.73	1.51	0.02	0.02	113.45
Max 2011	tpy->	1.22	4.40	4.61	0.03	0.01	308.58

ppd

Well Pad	2010	miles/day/vehicle	total miles/day	ROG	NOx	CO	PM10	PM2.5	CO2
9	Service Company Trucks	50	450	0.10	0.45	3.44	0.13	0.11	547.83
11	Pickup Trucks	50	550	0.22	0.65	6.48	0.11	0.09	480.22
1	Conventional Service Rig	50	50	0.08	0.09	0.84	0.01	0.01	201.76
4	Crew Trucks	50	200	0.08	0.24	2.36	0.04	0.03	174.62
1	Boom Truck	50	50	1.24	4.26	2.23	0.30	0.30	186.15
				1.72	5.69	15.34	0.60	0.54	1590.59

2010

ppd

Compressor Station and Line 172	2010	miles/day/vehicle	total miles/day	ROG	NOx	CO	PM10	PM2.5	CO2
8	Pickup Trucks	50	400	0.16	0.47	4.71	0.08	0.06	349.25
1	Tractor Trailer	40	40	0.94	3.15	1.69	0.22	0.20	337.57
4	Crew Trucks	50	200	0.08	0.24	2.36	0.04	0.03	174.62
				1.18	3.86	8.76	0.34	0.29	861.44

2011

ppd

Compressor Station and Line 172	2011	miles/day/vehicle	total miles/day	ROG	NOx	CO	PM10	PM2.5	CO2
14	Pickup Trucks	50	700	0.25	0.76	7.56	0.05	0.03	612.41
1	Tool Trailer	40	40	0.87	2.87	1.59	0.01	0.00	34.99
7	Crew Trucks	50	350	0.13	0.38	3.78	0.03	0.01	306.20
				1.25	4.01	12.93	0.08	0.04	953.60

2011

ppd

Metering Station and Line 400/401 Interconnect	2011	miles/day/vehicle	total miles/day	ROG	NOx	CO	PM10	PM2.5	CO2
17	Pickup Trucks	50	850	0.31	0.92	9.18	0.06	0.03	743.64
12	Crew Trucks	50	600	0.22	0.65	6.48	0.04	0.02	524.92
3	Tool & Tractor Trailer	40	120	2.61	8.62	4.76	0.02	0.00	104.98
				3.14	10.20	20.42	0.13	0.06	1373.54

2011		ppd							
		miles/day/vehicle	total miles/day	ROG	NOx	CO	PM10	PM2.5	CO2
Pipeline Construction									
23	Pickup Trucks	50	1150	0.42	1.25	12.42	0.08	0.05	1006.10
2	Flatbed Trucks	40	80	0.11	2.12	0.60	0.00	0.00	297.68
1	Winch Truck	40	40	0.87	2.87	1.59	0.01	0.00	34.99
6	Buses	40	240	0.32	6.37	1.80	0.00	0.00	893.04
1	Fuel Truck	40	40	0.87	2.87	1.59	0.01	0.00	34.99
3	Truck and Lowboy	40	120	2.61	8.62	4.76	0.02	0.00	104.98
6	Truck and Pole Trailer	40	240	5.22	17.24	9.52	0.05	0.00	209.97
1	Skid Truck	40	40	0.87	2.87	1.59	0.01	0.00	34.99
6	Parts Vans	50	300	6.53	21.55	11.91	0.06	0.00	262.46
				17.83	65.78	45.78	0.24	0.05	2879.22

EMFAC2007 Runs – Colusa County 2010 and 2011

Title : Colusa County APCD Avg Annual All CYrs 2009 to 2011 Default Title
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 5/28/2009 18:40:35
 Scen Year: 2010 -- All model years in the range 1966 to 2010 selected
 Season : Annual
 Area : Colusa County APCD

 Year: 2010 -- Model Years 1966 to 2010 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Colusa County APCD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	1.033	0.701	10.616	0	0	4.861
45	0	0.183	0.099	0.658	0	0	0.361

Pollutant Name: Carbon Monoxide Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	13.094	7.617	19.174	0	0	14.569
45	0	5.348	3.467	3.629	0	0	4.31

Pollutant Name: Oxides of Nitrogen Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	0.898	0.827	35.698	0	0	15.006
45	0	0.538	0.451	13.292	0	0	5.697

Pollutant Name: Carbon Dioxide Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 1242.79 1832.026 3831.377 0 0 2399.864
 45 0 396.398 552.701 1689.746 0 0 949.499

Pollutant Name: Sulfur Dioxide Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.012 0.018 0.037 0 0 0.023
 45 0 0.004 0.005 0.016 0 0 0.009

Pollutant Name: PM10 Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.07 0.11 2.412 0 0 1.028
 45 0 0.012 0.016 0.455 0 0 0.193

Pollutant Name: PM10 - Tire Wear Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.008 0.008 0.036 0 0 0.019
 45 0 0.008 0.008 0.036 0 0 0.019

Pollutant Name: PM10 - Brake Wear Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.013 0.013 0.028 0 0 0.019
 45 0 0.013 0.013 0.028 0 0 0.019

Pollutant Name: Methane Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.103 0.103 0.493 0 0 0.261
 45 0 0.038 0.035 0.031 0 0 0.035

Pollutant Name: PM2.5 Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL
 5 0 0.065 0.102 2.219 0 0 0.946
 45 0 0.011 0.015 0.419 0 0 0.177

Pollutant Name: PM2.5 - Tire Wear Temperature: 80F Relative

Speed
 MPH LDA LDT MDT HDT UBUS MCY ALL
 5 0 0.002 0.002 0.009 0 0 0.005
 45 0 0.002 0.002 0.009 0 0 0.005

Pollutant Name: PM2.5 - Brake Wear Temperature: 80F Relative

Speed
 MPH LDA LDT MDT HDT UBUS MCY ALL
 5 0 0.005 0.005 0.012 0 0 0.008
 45 0 0.005 0.005 0.012 0 0 0.008

Title : Colusa County APCD Avg Annual All CYrs 2009 to 2011 Default Title
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 5/28/2009 18:40:35
 Scen Year: 2011 -- All model years in the range 1967 to 2011 selected
 Season : Annual
 Area : Colusa County APCD

Year: 2011 -- Model Years 1967 to 2011 Inclusive -- Annual
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Colusa County APCD

Table 1:00 Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 80F Relative Humidity: 50%

Speed
 MPH LDA LDT MDT HDT UBUS MCY ALL
 5 0 0.934 0.653 9.883 0 0 4.567
 45 0 0.164 0.091 0.614 0 0 0.336

Pollutant Name: Carbon Monoxide Temperature: 80F Relative Humidity: 50%

Speed
 MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	11.941	7.188	18.017	0	0	13.597
45	0	4.904	3.295	3.406	0	0	4.001

Pollutant Name: Oxides of Nitrogen Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	0.827	0.776	32.618	0	0	13.902
45	0	0.493	0.422	12.043	0	0	5.234

Pollutant Name: Carbon Dioxide Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	1251.774	1832.925	3830.756	0	0	2416.471
45	0	397.189	552.777	1689.342	0	0	956.649

Pollutant Name: Sulfur Dioxide Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	0.012	0.018	0.037	0	0	0.023
45	0	0.004	0.005	0.016	0	0	0.009

Pollutant Name: PM10 Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	0.069	0.115	2.138	0	0	0.929
45	0	0.012	0.016	0.416	0	0	0.179

Pollutant Name: PM10 - Tire Wear Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5	0	0.008	0.008	0.036	0	0	0.019
45	0	0.008	0.008	0.036	0	0	0.019

Pollutant Name: PM10 - Brake Wear Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.013 0.013 0.028 0 0 0.019
 45 0 0.013 0.013 0.028 0 0 0.019

Pollutant Name: Methane Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.097 0.1 0.459 0 0 0.246
 45 0 0.035 0.033 0.029 0 0 0.032

Pollutant Name: PM2.5 Temperature: 80F Relative Humidity: 50%

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.064 0.107 1.967 0 0 0.855
 45 0 0.011 0.015 0.383 0 0 0.165

Pollutant Name: PM2.5 - Tire Wear Temperature: 80F Relative Humidity:

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.002 0.002 0.009 0 0 0.005
 45 0 0.002 0.002 0.009 0 0 0.005

Pollutant Name: PM2.5 - Brake Wear Temperature: 80F Relative Humidity:

Speed

MPH LDA LDT MDT HDT UBUS MCY ALL

5 0 0.005 0.005 0.012 0 0 0.008
 45 0 0.005 0.005 0.012 0 0 0.008

Temporary Compressor Emissions

Temporary compressor emissions were based on the use of a catalytic converter to control emissions of ROG, NOx, and CO (DCL International, 2008). Emissions for PM10, PM2.5 and CO2 were based on U.S. EPA AP-42 emission factors (U.S. EPA, 2000).

Fuel Usage	ppmvd	NOx	
Btu/BHP-hr	@ 15% O2	lb/MMBtu	g/BHP-hr
7,600	4	0.015	0.05
	ppmvd	CO	
Btu/BHP-hr	@ 15% O2	lb/MMBtu	g/BHP-hr
7,600	56	0.126	0.43
Fuel Usage	ppmvd	VOC	
Btu/BHP-hr	@ 15% O2	lb/MMBtu	g/BHP-hr
7,600	25	0.032	0.11

Standard Temperature (SJVUAPCD)		
68	deg F	
Molar Volume	385.3	scf/mole
F-Factor	8710	scf/MMBtu @ 0% O2, 68 deg F

	ROG	NOX	CO	PM10	PM2.5	CO2
hp	Ppd	pounds/day	Ppd	Ppd	ppd	ppd
1485	8.67	3.99	33.98	0.86	0.86	9957.82
tpy	1.04	0.48	4.08	0.10	0.10	1194.94
horsepower		PM10	PM2.5	CO2		
1485	Lbs/MMBtu->	9.50E-03	9.50E-03	1.10E+02	AP-42 emission factors	
	ppd->	0.86	0.86	9957.82		
	tpy ->	0.10	0.10	1194.94		

Temporary Compressor assumed to operate April 2009 through November, 2009



Head office address: 241 Bradwick Drive, Concord, Ontario, Canada L4K 1K5

Mailing address: P.O. Box 90, Concord, Ontario, Canada L4K 1B2

Tel: (905) 660-6450 Toll free: 1-800-872-1968 Fax: (905) 660-6435 E-mail: info@dcl-inc.com Website: www.dcl-inc.com

QUOTATION

To	Preston Batula	Phone	281-836-7562
	Exterran	Fax	281-836-8562
Date	October 16, 2008	Email	Preston.Batula@exterran.com

Quote No.: 16-749

RE: CATALYTIC CONVERTER

ENGINE DATA

Engine model	Waukesha F9390 GS1
Power	1642 hp @ 1000 rpm
Fuel	Pipeline Quality Natural Gas
Exhaust Flow	10,565 lb/hr
Exhaust Temperature	1,108 F

CATALYST SYSTEM DATA

	2 Elements Installed	3 Elements Installed
Catalyst Model	2-DC76-14	3-DC76-14
Catalyst Type	NSCR	NSCR
Number of Elements	2	3
Cell Density	300 cpsi	300 cpsi
Approx. Dimensions	37" OD x 61" OAL - converter 37" OD 220" OAL - catalytic silencer	37" OD x 61" OAL - converter 37" OD 220" OAL - catalytic silencer
Connection Size	14"	14"
Approx Weight	600 lbs - converter 1900 lbs - catalytic silencer	700 lbs - converter 2000 lbs - catalytic silencer
Approx. Pressure Drop	3-4" w.c. - converter 9-10" w.c. - catalytic silencer	4-5" w.c. - converter 10-12" w.c. - catalytic silencer

SILENCER SYSTEM DATA

Silencer Grade	Hospital	Hospital
Approx. Attenuation	35-40 dBA	35-40 dBA

EMISSION REQUIREMENTS

Exhaust Gas Component	Converter Output (2 elements installed)	Converter Output (3 elements installed)
NOx	10 ppm @ 15% O ₂	4 ppm @ 15% O ₂
CO	56 ppm @ 15% O ₂	56 ppm @ 15% O ₂
VOC	25 ppm @ 15% O ₂	25 ppm @ 15% O ₂
CHOH	0.02 g/bhp-hr	0.02 g/bhp-hr

Construction Emissions – Over Threshold Calculations

Time Slice	days	ppd - offroad	ppd - onroad	ppd - temporary compressor	ppd - total	NOx Threshold	Daily Pounds Over Threshold	Total Time Slice pounds over threshold	Total Time Slice tons over threshold
Time Slice 7/1/2010 - 7/16/2010	12	20.8	9.5	3.99	34.29	137	0	0.00	0.00
Time Slice 7/19/2010-8/31/2010	32	90.25	9.5	3.99	103.74	137	0	0.00	0.00
Time Slice 9/1/2010-9/17/2010	13	108.81	9.5	3.99	122.3	137	0	0.00	0.00
Time Slice 9/20/2010-9/24/2010	5	25.63	9.5	3.99	39.12	137	0	0.00	0.00
Time Slice 9/27/2010-9/30/2010	4	38.06	9.5	3.99	51.55	137	0	0.00	0.00
Time Slice 10/1/2010-12/31/2010	66	30.98	80	3.99	114.97	137	0	0.00	0.00
Time Slice 1/3/2011-2/28/2011	41	9.33	80	3.99	93.32	137	0	0.00	0.00
Time Slice 3/1/2011-3/31/2011	23	205.21	80	3.99	289.2	137	152.2	3500.60	1.75
Time Slice 4/1/2011-4/1/2011	1	195.88	80	3.99	279.87	137	142.87	142.87	0.07
Time Slice 4/4/2011-5/31/2011	42	214.9	80	3.99	298.89	137	161.89	6799.38	3.40
Time Slice 6/1/2011-6/10/2011	8	232.37	80	3.99	316.36	137	179.36	1434.88	0.72
Time Slice 6/13/2011-7/8/2011	20	223.85	80	3.99	307.84	137	170.84	3416.80	1.71
Time Slice 7/11/2011-7/15/2011	5	223.85	80	3.99	307.84	137	170.84	854.20	0.43
Time Slice 7/18/2011-9/2/2011	35	216.59	80	3.99	300.58	137	163.58	5725.30	2.86
Time Slice 9/5/2011-10/7/2011	25	219.63	80	3.99	303.62	137	166.62	4165.50	2.08
Time Slice 10/10/2011-10/14/2011	5	220.92	80	3.99	304.91	137	167.91	839.55	0.42
Time Slice 10/17/2011-10/28/2011	10	208.87	80	3.99	292.86	137	155.86	1558.60	0.78
Time Slice 10/31/2011-10/31/2011	1	12.99	80	3.99	96.98	137	0	0.00	0.00
Time Slice 11/1/2011-11/30/2011	22	0	80	3.99	83.99	137	0	0.00	0.00
TOTALS								28437.68	14.22

Operational Emissions

Summary of Operational Emissions

Operational Emissions (lbs/day)	ROG	NOx	CO	PM10	PM2.5	SO2						Metric tons CO2e
On-Road	0.19	0.18	2.87	0.55	0.10	0.00						
Area Sources	0.00	0.01	0.01	0.00	0.00	0.00						
Stationary Sources w/BACT	60.52	67.85	200.89	22.82	22.82	6.55						
Blowdown	6.58	-	-	-	-	-						
Totals	67.28	68.04	203.77	23.37	22.92	6.55						
Operational Emissions (tons/yr)	ROG	NOx	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e	Metric tons CO2e	
On-Road	0.04	0.04	0.52	0.10	0.02	0.00	50.85	0.00	0.00	51.32	46.57	
Area Sources (excluding electricity)	0.00	0.00	0.00	0.00	0.00	0.00	2.92	0.00	0.00	2.92	2.65	
Electricity (Direct + Indirect for Water)							0.34	0.00	0.00	0.34	0.31	
Stationary Sources w/BACT	3.91	4.19	13.93	1.71	1.71	0.50	17,562.04	0.31	0.03	17,579.34	15,952.22	
Blowdown	1.20	-	-	-	-	-	0.00	31.16	0.00	654.36	593.79	
Totals	5.15	4.23	14.45	1.81	1.73	0.50	17,616.15	31.47	0.03	18,288.28	16,595.54	

Stationary Source Emissions

Operational Emission Calculations

Equipment	Compressor Engine 1	Compressor Engine 2	Compressor Engine 3	Natural Draft Burner	Reboiler 1	Reboiler 2	Reboiler 3	Still Vent /w Vapor Recovery Unit	Natural Gas Backup Generator	Temporary Compressor (Construction-Related)
Make	Caterpillar	Caterpillar	Caterpillar	NATCO					Caterpillar	Waukesha
Model	3612	3612	3612						G3412C LE	PG9390GSI
Rating (brake horsepower)	3550	3550	3550					300	503	1485
(Units)	horsepower	horsepower	horsepower					MMscf/day	hp	horsepower
Fuel Rate	7436	7436	7436	0.4	1.4	1.4	1.4	1.397	4.729	3.7719
(Units)	Btu/bhp-hr	Btu/bhp-hr	Btu/bhp-hr	MMBTU/hr	MMBTU/hr	MMBTU/hr	MMBTU/hr	MMBTU/hr	MMBTU/hr	MMBTU/hr
Max hours/day	24	24	24	24	24	24	24	24	10	24
Average hours/day	—	—	—	18	18	18	18	18	10	18
Max days/year	—	—	—	330	330	330	330	330	10	240
Max hours/year	3545	3545	3545	5940	5940	5940	5940	5940	100	4320
CRITERIA EMISSIONS										
NOx										
Factor	0.7	0.7	0.7	0.083	0.1	0.1	0.1	0.098	2.0	0.06
(Units)	grams/bhp-hr	grams/bhp-hr	grams/bhp-hr	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	g/hp-hr	grams/bhp-hr
Source	A	A	A	H	B	B	B	B	I	J
Pounds/day/unit	131.37	131.37	131.37	0.80	3.36	3.36	3.36	3.28	22.16	3.99
Tons/year/unit	9.7	9.7	9.7	0.10	0.42	0.42	0.42	0.41	0.1	0.36
BACT Effectiveness	0.92	0.92	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds/day/unit w/BACT	10.51	10.51	10.51	0.80	3.36	3.36	3.36	3.28	22.16	3.99
Tons/year/unit w/BACT	0.78	0.78	0.78	0.10	0.42	0.42	0.42	0.41	0.11	0.36
CO										
Factor	2.5	2.5	2.5	0.065	0.075	0.075	0.075	0.082	1.9	0.43
(Units)	grams/bhp-hr	grams/bhp-hr	grams/bhp-hr	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	lb/MMBTU	grams/bhp-hr	grams/bhp-hr
Source	A	A	A	H	B	B	B	B	I	J
Pounds/day/unit	469.16	469.16	469.16	0.63	2.52	2.52	2.52	2.75	21.05	33.98
Tons/year/unit	34.6	34.6	34.6	0.08	0.31	0.31	0.31	0.34	0.1	3.0
BACT Effectiveness	0.88	0.88	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds/day/unit w/BACT	56.30	56.30	56.30	0.63	2.52	2.52	2.52	2.75	21.05	33.98
Tons/year/unit w/BACT	4.16	4.16	4.16	0.08	0.31	0.31	0.31	0.34	0.11	3.04

Equipment	Compressor Engine 1	Compressor Engine 2	Compressor Engine 3	Natural Draft Burner	Reboiler 1	Reboiler 2	Reboiler 3	Still Vent /w Vapor Recovery Unit	Natural Gas Backup Generator	Temporary Compressor (Construction-Related)
ROC										
Factor (Units)	0.25 grams/bhp-hr	0.25 grams/bhp-hr	0.25 grams/bhp-hr	0.040 lb/MMBTU	0.006 lb/MMBTU	0.006 lb/MMBTU	0.006 lb/MMBTU	0.0054 lb/MMBTU	0.80 lbs/MMBtu	0.11 grams/bhp-hr
Source	B	B	B	H	B	B	B	B	I	J
Pounds/day/unit	46.92	46.92	46.92	0.38	0.20	0.20	0.20	0.18	8.86	8.67
Tons/year/unit	3.5	3.5	3.5	0.05	0.02	0.02	0.02	0.02	0.04	0.8
BACT Effectiveness	0.64	0.64	0.64	0.00	0.00	0.00	0.00	0.999	0.00	0.00
Pounds/day/unit w/BACT	16.89	16.89	16.89	0.38	0.20	0.20	0.20	0.00	8.86	8.67
Tons/year/unit w/BACT	1.25	1.25	1.25	0.05	0.02	0.02	0.02	0.00	0.04	0.78
SO2										
Factor (Units)	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu	0.00313 lbs/MMBtu
Source	F	F	F	F	F	F	F	F	F	F
Pounds/day/unit	1.98	1.98	1.98	0.03	0.11	0.11	0.11	0.10	0.15	0.28
Tons/year/unit	0.15	0.15	0.15	0.004	0.01	0.01	0.01	0.01	0.00	0.03
PM10										
Factor (Units)	0.0111 lb/MMBtu	0.0111 lb/MMBtu	0.0111 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0111 lb/MMBtu	0.0095 lb/MMBtu
Source	B	B	B	B	B	B	B	C	D	D
Pounds/day/unit	7.03	7.03	7.03	0.08	0.28	0.28	0.28	0.28	0.52	0.86
Tons/year/unit	0.52	0.52	0.52	0.01	0.03	0.03	0.03	0.03	0.00	0.08
PM2.5										
Factor (Units)	0.0111 lb/MMBtu	0.0111 lb/MMBtu	0.0111 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0083 lb/MMBtu	0.0111 lb/MMBtu	0.0095 lb/MMBtu
Source	B	B	B	B	B	B	B	C	D	D
Pounds/day/unit	7.03	7.03	7.03	0.08	0.28	0.28	0.28	0.28	0.52	0.86
Tons/year/unit	0.52	0.52	0.52	0.01	0.03	0.03	0.03	0.03	0.00	0.08
GREENHOUSE GAS EMISSIONS										
CO2										
Factor (Units)	110.0 lb/MMBtu	110.0 lb/MMBtu	110.0 lb/MMBtu	117.6 lb/MMBtu	117.6 lb/MMBtu	117.6 lb/MMBtu	117.6 lb/MMBtu	117.6 lb/MMBtu	110.0 lb/MMBtu	110.0 lb/MMBtu
Source	D	D	D	C	C	C	C	C	D	D
Pounds/day/unit	69,690.19	69,690.19	69,690.19	1,129.41	3,952.94	3,952.94	3,952.94	3,943.48	5,201.90	9,957.82
Tons/year/unit	5,146.91	5,146.91	5,146.91	139.76	489.18	489.18	489.18	488.01	26.01	896.20

Equipment	Compressor Engine 1	Compressor Engine 2	Compressor Engine 3	Natural Draft Burner	Reboiler 1	Reboiler 2	Reboiler 3	Still Vent /w Vapor Recovery Unit	Natural Gas Backup Generator	Temporary Compressor (Construction-Related)
CH4										
Factor (Units)	0.0022 lb/MMBtu	0.0022 lb/MMBtu	0.0022 lb/MMBtu	0.0110 lb/MMBtu	0.0110 lb/MMBtu	0.0110 lb/MMBtu	0.0110 lb/MMBtu	0.0110 lb/MMBtu	0.0022 lb/MMBtu	0.0130 lb/MMBtu
Source	G	G	G	G	G	G	G	G	G	G
Pounds/day/unit	1.40	1.40	1.40	0.11	0.37	0.37	0.37	0.37	0.10	1.18
Tons/year/unit	0.10	0.10	0.10	0.01	0.05	0.05	0.05	0.05	0.00	0.11
BACT Effectiveness	0.64	0.64	0.64	0.00	0.00	0.00	0.00	0.000	0.00	0.64
Pounds/day/unit w/BACT	0.50	0.50	0.50	0.11	0.37	0.37	0.37	0.37	0.10	0.42
Tons/year/unit w/BACT	0.037	0.037	0.037	0.013	0.046	0.046	0.046	0.046	0.001	0.038
N2O										
Factor (Units)	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu	0.00022 lb/MMBtu
Source	G	G	G	G	G	G	G	G	G	G
Pounds/day/unit	0.14	0.14	0.14	0.00	0.01	0.01	0.01	0.01	0.01	0.00
Tons/year/unit	0.010	0.010	0.010	0.0003	0.001	0.001	0.001	0.001	0.000	0.000

Note: Operating hours for compressor engines reflect 37,750,000 bhp-hr/yr at full rated load. All other equipment, except backup generator, is assumed to operate an average of 18 hrs/day, 330 days/yr.

References:

- A. Based on manufacturer specifications: Caterpillar G3612 Gas Petroleum Engine
- B. Based on emissions specification for similar equipment found in Wild Goose Storage Inc. permit application
- C. EPA, AP-42, Section 1.4, 7/98, Table 1.4-1&2, Emission Factors for Natural Gas Combustion
- D. EPA, AP-42, Section 3.2, 7/00, Table 3.2-2
- E. Based on manufacturer specifications: Caterpillar G3616 Gas Petroleum Engine
- F. Based on maximum sulfur in fuel @ 1 grain/100 scf (PG&E Tariff GR-21); 914 Btu/scf
- G. California Climate Action Registry. 2009. General Reporting Protocol, Version 3.1
- H. Based on NATCO Spec Sheet (June 15, 2009)
- I. Based on manufacturer specifications: Caterpillar Gas Generator Set CAT G3412C LE Gas Engine
- J. Based on manufacturer specifications: Waukesha P9390/GSI

On-Road Vehicle Trip Emissions

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Tim Rimpol\Application Data\Urbemis\Version9a\Projects\central valley operational June 1.urb924

Project Name: Central Valley Gas Storage

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:

AREA SOURCE 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 (lbs/day, unmitigated)	0.00	0.01	0.01	0.00	0.00	0.00	16.00

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 (lbs/day, unmitigated)	0.19	0.18	2.87	0.00	0.55	0.10	292.98

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 (lbs/day, unmitigated)	0.19	0.19	2.88	0.00	0.55	0.10	308.98

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.00	0.01	0.01	0.00	0.00	0.00	16.00
Hearth							
Landscape							
Consumer Products							
Architectural Coatings							
TOTALS (lbs/day, unmitigated)	0.00	0.01	0.01	0.00	0.00	0.00	16.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOX</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM25</u>	<u>CO2</u>
Compressor Station	0.19	0.18	2.87	0.00	0.55	0.10	292.98
TOTALS (lbs/day, unmitigated)	0.19	0.18	2.87	0.00	0.55	0.10	292.98

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type 1000 sq ft	No. Units	Total Trips	Total VMT
Compressor Station		8.00		2.00	16.00	320.00
					16.00	320.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.0	0.8	99.0	0.2
Light Truck < 3750 lbs	50.0	1.8	93.6	4.6
Light Truck 3751-5750 lbs	0.0	0.5	99.5	0.0

Med Truck 5751-8500 lbs	0.0	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	60.0	40.0	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commute	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	20.0	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Compressor Station				100.0	0.0	0.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Tim Rimpo\Application Data\Urbemis\Version9a\Projects\central valley operational June 1.urb924

Project Name: Central Valley Gas Storage

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:

AREA SOURCE 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)	0.00	0.00	0.00	0.00	0.00	0.00	2.92

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)	0.04	0.04	0.52	0.00	0.10	0.02	50.85

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)	0.04	0.04	0.52	0.00	0.10	0.02	53.77

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	2.92
Hearth							
Landscape							
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	2.92

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOX</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM25</u>	<u>CO2</u>
---------------	------------	------------	-----------	------------	-------------	-------------	------------

Compressor Station	0.04	0.04	0.52	0.00	0.10	0.02	50.85
TOTALS (tons/year, unmitigated)	0.04	0.04	0.52	0.00	0.10	0.02	50.85

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 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
Compressor Station		8.00	1000 sq ft	2.00	16.00	320.00
					16.00	320.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.0	0.8	99.0	0.2
Light Truck < 3750 lbs	50.0	1.8	93.6	4.6
Light Truck 3751-5750 lbs	0.0	0.5	99.5	0.0
Med Truck 5751-8500 lbs	0.0	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	60.0	40.0	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commute	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	20.0	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)
Compressor Station

100.0

0.0

0.0

Electricity GHG Emissions – Direct and Indirect (Water Use)

Table ES-1. Recommended revised water-energy proxies

	Indoor Uses		Outdoor Uses	
	Northern California	Southern California	Northern California	Southern California
	kWh/MG	kWh/MG	kWh/MG	kWh/MG
Water Supply and Conveyance	2,117	9,727	2,117	9,727
Water Treatment	111	111	111	111
Water Distribution	1,272	1,272	1,272	1,272
Wastewater Treatment	1,911	1,911	0	0
Regional Total	5,411	13,022	3,500	11,111

Electricity Use

Electricity Use
PG&E Climate Zone 3 (Itron, 2006)

9.391698602	kwh/sf	For small office uses		
2000	sf			
18783.3972	kwh/year			
18.7833972	mwh/year			
	metric			
	CO2	CH4	N2O	CO2e
	7.56	0.00	0.00	6.87

Water –Related Water use

12,930	gallons per month
431	gallons per day
157315	gallons per year

Nauges

Greenhouse Gas Emission Factors	CO2	CH4	N2O
Electricity	804.54	0.01	0.00
Units	#/mwh	#/mwh	#/mwh

0.000431	millions gallons per day
0.157315	millions gallons per year

2.332141	kwh/day
851.231465	kwh/year

0.002332141	mwh/day
0.851231465	mwh/year

	CO2	CH4	N2O	Metric CO2e
Daily (pounds)	1.876301	1.56E-05	8.63E-06	
Annual (tons)	0.342425	2.85E-06	1.57E-06	0.31122772

Blowdown Emissions

Blowdown Assumptions		
Two emergency blowdowns per year		
Blowdown release per event	0.70	mmscf
Total emergency blowdown venting/year	1.40	mmscf
Total maintenance blowdown/month	0.01	mmscf
Total maintenance blowdown/year	0.12	mmscf
Total annual blowdown release	1.52	mmscf
Pounds CH4 per MMSCF	41,000.00	
Pounds CH4 released per year	62,320.00	
Tons CH4 released per year	31.16	
Pounds CH4 released per day	170.74	
tons ROG released per year	1.20	
pounds ROG released per day	6.58	
References:		
Blowdown Amounts from:		
Initial Study for Central Valley Gas Storage Project, Section 4. Description of the Project, Subsection 4.4.2.1		
Pounds CH4 per MMscf from:		
U.S. EPA. 2000. Emission Factors 3.2 Natural Gas-Fired Reciprocating Engines, Table 3.2.2, Footnote d.		

Health Risk Assessment

The California Air Resources Board's Hot Spots Analysis and Reporting Program (HARP) was used to evaluate the potential health risks associated with the project. HARP incorporates the Industrial Source Complex – Short Term, Version 3 (ISCST3) air quality dispersion model, which can estimate the air quality impacts of single or multiple sources using actual meteorological conditions.

The tables that follow show the emission calculations for the compressor engines, the dehydration reboilers, and the oxidizer/incinerator unit that will control emissions from the glycol regenerator. The first column in the table below lists the relevant toxic air contaminants (TAC), and the fourth and fifth columns show the hourly and annual emission factors for each TAC, respectively. TAC emission estimates for the engines and reboilers were based on U.S. EPA emission factors from the relevant AP-42 sections for internal combustion engines and boilers. TAC emission estimates for the oxidizer/incinerator unit were based on GRI's GLYCalc software program. For the compressor engines, the maximum emission rate represents all three compressor engines and includes the ROG emission reductions associated with BACT. The reboiler emissions do not assume any emission controls, while the oxidizer assumes a 99.5 percent reduction in TACs.

All ISCST3 modeling was conducted assuming a 1 gram per second emission rate. Stack parameters, the emission control efficiency for the oxidizer, and natural gas constituent data (used for GRI-GLYCalc) was provided by EAEngineering (Miller, M. – June 12, 2009 e-mails regarding emissions data). Two years of meteorological data from a monitoring station in Colusa were obtained from the CARB HARP website (<http://www.arb.ca.gov/toxics/harp/metfiles.htm>).

Maximum 1-hour concentrations of toxic air contaminants estimated by HARP were used to estimate acute health impacts. Annual average concentrations of TACs estimated by HARP were used to estimate the chronic health impacts and cancer risks. All calculations were performed using the default assumptions in HARP. Health impacts were estimated for 14 receptors in the vicinity of the compressor station. The HARP output results for the acute and chronic health hazard indices and cancer risks follow the emission estimates and figure showing the receptor locations.

HRA Emission Rates

Compressor Engines				
Pollutant	Emission Factor (lb/MMBtu)	max emission rate		
		acute (grams/second)	Max Hourly (lbs/hour)	Annual (lbs/year)
1,1,2,2-Tetrachlorethane	4.00E-05	1.44E-04	1.14E-03	4.04E+00
1,1-Dichloroethane	2.36E-05	8.49E-05	6.73E-04	2.39E+00
1,3-Butadiene	2.67E-04	9.60E-04	7.61E-03	2.70E+01
Acetaldehyde	8.36E-03	3.01E-02	2.38E-01	8.45E+02
Acrolein	5.14E-03	1.85E-02	1.47E-01	5.19E+02
Benzene	4.40E-04	1.58E-03	1.25E-02	4.45E+01
Benzo(b)fluoranthene	1.66E-07	5.97E-07	4.73E-06	1.68E-02
Carbon Tetrachloride	3.67E-05	1.32E-04	1.05E-03	3.71E+00
Chlorobenzene	3.04E-05	1.09E-04	8.67E-04	3.07E+00
Chloroform	2.85E-05	1.02E-04	8.13E-04	2.88E+00
Chrysene	6.93E-07	2.49E-06	1.98E-05	7.00E-02
Ethylbenzene	3.97E-05	1.43E-04	1.13E-03	4.01E+00
Ethylene Dibromide	4.43E-05	1.59E-04	1.26E-03	4.48E+00
Formaldehyde	5.28E-02	1.90E-01	1.51E+00	5.34E+03
n-Hexane	1.11E-03	3.99E-03	3.16E-02	1.12E+02
Methanol	2.50E-03	8.99E-03	7.13E-02	2.53E+02
Methylene Chloride	2.00E-05	7.19E-05	5.70E-04	2.02E+00
Napthalene	7.44E-05	2.67E-04	2.12E-03	7.52E+00
Phenol	2.40E-05	8.63E-05	6.84E-04	2.43E+00
Styrene	2.36E-05	8.49E-05	6.73E-04	2.39E+00
Tetrachloroethane	2.48E-06	8.92E-06	7.07E-05	2.51E-01
Toluene	4.08E-04	1.47E-03	1.16E-02	4.12E+01
Vinyl Chloride	1.49E-05	5.36E-05	4.25E-04	1.51E+00
Xylene	1.84E-04	6.62E-04	5.25E-03	1.86E+01
1,1,2-Trichloroethane	3.18E-05	1.14E-04	9.07E-04	3.21E+00
1,3-Dichloropropene	2.64E-05	9.49E-05	7.53E-04	2.67E+00

Dehy Reboilers				
Pollutant	Emission Factor (lb/MMBtu)	max emission rate		
		acute (grams/second)	Max Hourly (lbs/hour)	Annual (lbs/year)
Benz(a)anthracene	1.82E-09	1.38E-09	1.09E-08	6.50E-05
Benzene	2.06E-06	1.56E-06	1.24E-05	7.34E-02
Benzo(a)pyrene	1.18E-09	8.90E-10	7.06E-09	4.19E-05
Benzo(b)fluoranthene	1.76E-09	1.34E-09	1.06E-08	6.29E-05
Benzo(k)fluoranthene	1.76E-09	1.34E-09	1.06E-08	6.29E-05
Chrysene	1.76E-09	1.34E-09	1.06E-08	6.29E-05
Dibenzo(a,h)anthracene	1.18E-09	8.90E-10	7.06E-09	4.19E-05
Dichlorobenzene	1.18E-06	8.90E-07	7.06E-06	4.19E-02
Formaldehyde	7.35E-05	5.56E-05	4.41E-04	2.62E+00
Indeno(1,2,3-cd)pyrene	1.76E-09	1.34E-09	1.06E-08	6.29E-05
Naphthalene	5.98E-07	4.53E-07	3.59E-06	2.13E-02
Toulene	3.33E-06	2.52E-06	2.00E-05	1.19E-01
Arsenic	1.96E-07	1.48E-07	1.18E-06	6.99E-03
Beryllium	1.18E-08	8.90E-09	7.06E-08	4.19E-04
Cadmium	1.08E-06	8.16E-07	6.47E-06	3.84E-02
Chromium	1.37E-06	1.04E-06	8.24E-06	4.89E-02
Copper	8.33E-07	6.31E-07	5.00E-06	2.97E-02
Manganese	3.73E-07	2.82E-07	2.24E-06	1.33E-02
Mercury	2.55E-07	1.93E-07	1.53E-06	9.08E-03
Nickel	2.06E-06	1.56E-06	1.24E-05	7.34E-02
Selenium	2.35E-08	1.78E-08	1.41E-07	8.39E-04
7,12-dimethylbenz(a)anthracene	1.57E-08	1.19E-08	9.41E-08	5.59E-04
Hexane	1.76E-03	1.34E-03	1.06E-02	6.29E+01
Vanadium	2.25E-06	1.71E-06	1.35E-05	8.04E-02
Incinerator (Oxidizer)				
Pollutant	Emission Factor (lb/hr)	max emission rate		
		acute (grams/second)	Max Hourly (lbs/hour)	Annual (lbs/year)
Benzene	3.93E-02	4.96E-03	3.93E-02	2.33E+02
Ethylbenzene	1.56E-01	1.96E-02	1.56E-01	9.24E+02
n-hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	7.96E-02	1.00E-02	7.96E-02	4.73E+02
Xylene	2.06E-01	2.60E-02	2.06E-01	1.22E+03

Emission Factors for Compressors from Table 3.2.2 of Chapter 3.2 AP-42 for Natural Gas Reciprocating Engines, 4-stroke lean burn

Emission Factors for Boilers from Table 1.4.3 of Chapter 1.4 AP-42 for Natural Gas Combustion Boilers

Emission Factors for Oxidizer from GRI's GlyCalc software program

Page: 1

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: Nicor Oxidizer

File Name: C:\Projects\NiCor Energy Underground Nat Gas Storage\Respond to Comments\Revised HRA\glycol deh calc.ddf

Date: June 13, 2009

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0725	1.740	0.2349
Ethane	0.0226	0.542	0.0731
Propane	0.0027	0.066	0.0089
Isobutane	0.0006	0.014	0.0019
n-Butane	0.0016	0.039	0.0053
Benzene	0.0393	0.942	0.1272
Toluene	0.0796	1.911	0.2579
Ethylbenzene	0.1556	3.734	0.5041
Xylenes	0.2058	4.938	0.6667
Total Emissions	0.5802	13.926	1.8800
Total Hydrocarbon Emissions	0.5802	13.926	1.8800
Total VOC Emissions	0.4852	11.644	1.5719
Total HAP Emissions	0.4802	11.525	1.5559
Total BTEX Emissions	0.4802	11.525	1.5559

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	14.5003	348.006	46.9809
Ethane	4.5146	108.350	14.6273
Propane	0.5471	13.129	1.7725
Isobutane	0.1150	2.761	0.3727
n-Butane	0.3245	7.788	1.0513
Benzene	7.8515	188.436	25.4388
Toluene	15.9213	382.111	51.5850
Ethylbenzene	31.1189	746.853	100.8252
Xylenes	41.1533	987.679	133.3367
Total Emissions	116.0464	2785.114	375.9903
Total Hydrocarbon Emissions	116.0464	2785.114	375.9903
Total VOC Emissions	97.0315	2328.757	314.3822
Total HAP Emissions	96.0450	2305.079	311.1857
Total BTEX Emissions	96.0450	2305.079	311.1857

Page: 2

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0109	0.262	0.0353
Ethane	0.0012	0.030	0.0040
Propane	0.0001	0.002	0.0002
Isobutane	<0.0001	<0.001	<0.0001
n-Butane	<0.0001	0.001	0.0001
Benzene	<0.0001	<0.001	0.0001
Toluene	<0.0001	0.001	0.0001
Ethylbenzene	<0.0001	0.001	0.0001
Xylenes	<0.0001	0.001	0.0001
Total Emissions	0.0124	0.297	0.0401
Total Hydrocarbon Emissions	0.0124	0.297	0.0401
Total VOC Emissions	0.0002	0.006	0.0008
Total HAP Emissions	0.0001	0.003	0.0004
Total BTEX Emissions	0.0001	0.003	0.0004

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	2.1802	52.325	7.0639
Ethane	0.2489	5.974	0.8065
Propane	0.0150	0.359	0.0485
Isobutane	0.0025	0.059	0.0080
n-Butane	0.0057	0.138	0.0186
Benzene	0.0038	0.091	0.0123
Toluene	0.0059	0.142	0.0192
Ethylbenzene	0.0080	0.193	0.0261
Xylenes	0.0077	0.185	0.0250
Total Emissions	2.4778	59.468	8.0281
Total Hydrocarbon Emissions	2.4778	59.468	8.0281
Total VOC Emissions	0.0487	1.168	0.1577
Total HAP Emissions	0.0255	0.612	0.0826
Total BTEX Emissions	0.0255	0.612	0.0826

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

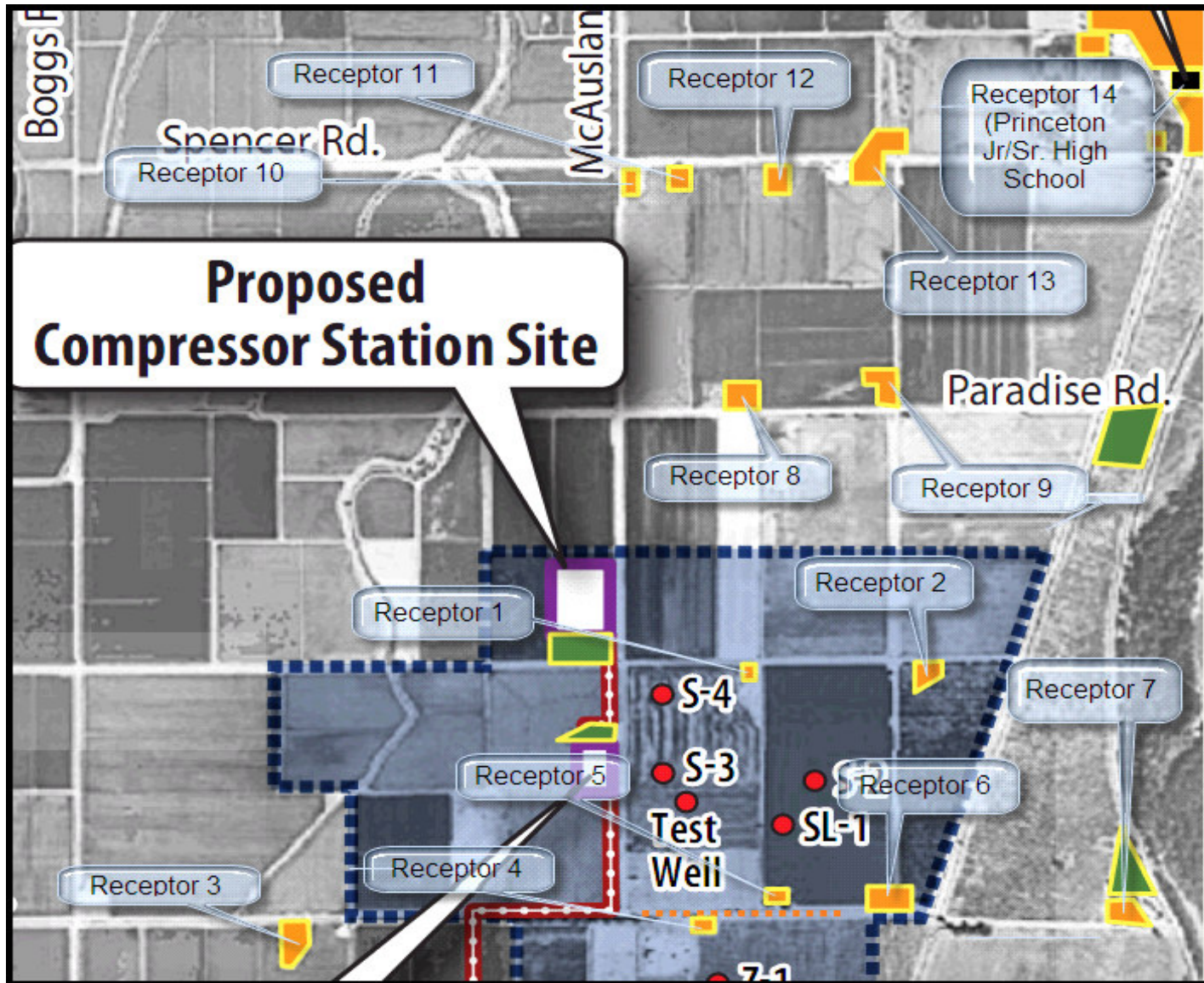
Component	lbs/hr	lbs/day	tons/yr
Methane	0.0834	2.002	0.2702

Page: 3

Ethane	0.0238	0.572	0.0772
Propane	0.0028	0.067	0.0091
Isobutane	0.0006	0.014	0.0019
n-Butane	0.0017	0.040	0.0053
Benzene	0.0393	0.943	0.1273
Toluene	0.0796	1.911	0.2580
Ethylbenzene	0.1556	3.735	0.5043
Xylenes	0.2058	4.939	0.6668

Total Emissions	0.5926	14.223	1.9201
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Total Hydrocarbon Emissions	0.5926	14.223	1.9201
Total VOC Emissions	0.4854	11.650	1.5727
Total HAP Emissions	0.4804	11.528	1.5563
Total BTEX Emissions	0.4804	11.528	1.5563



Acute Health Impact Results

This file: C:\HARP\PROJECTS\Rep_Acu_AllRec_AllSrc_AllCh_ByRec.txt

Created by HARP Version 1.4a Build 23.07.00

Uses ISC Version 99155

Uses BPIP (Dated: 04112)

Creation date: 12/17/2009 1:52:13 PM

EXCEPTION REPORT

(there have been no changes or exceptions)

INPUT FILES:

Source-Receptor file: C:\HARP\PROJECTS\DEFAULT.SRC

Averaging period adjustment factors file: not applicable

Emission rates file: database

Site parameters file:

Coordinate system: UTM NAD83

Screening mode is OFF

Analysis method: Point Estimate

Health effect: Acute HI Simple (Concurrent Max.)

Receptor(s): All

Sources(s): All

Chemicals(s): All

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND
			(ug/m ³)	
0001	71432	Benzene	Benzene	0.000E+00
0002	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0003	108883	Toluene	Toluene	0.000E+00
0004	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0005	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0006	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0007	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0008	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0009	218019	Chrysene	Chrysene	0.000E+00
0010	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0011	25321226	DiClBenzenes	Dichlorobenzenes (mixed isomers)	0.000E+00
0012	50000	Formaldehyde	Formaldehyde	0.000E+00
0013	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0014	91203	Naphthalene	Naphthalene	0.000E+00
0015	7440382	Arsenic	Arsenic	0.000E+00
0016	7440417	Beryllium	Beryllium	0.000E+00
0017	7440439	Cadmium	Cadmium	0.000E+00
0018	7440508	Copper	Copper	0.000E+00
0019	7440473	Chromium	Chromium	0.000E+00
0020	7439965	Manganese	Manganese	0.000E+00
0021	7439976	Mercury	Mercury	0.000E+00
0022	7440020	Nickel	Nickel	0.000E+00
0023	7782492	Selenium	Selenium	0.000E+00
0024	57976	7,12-DB[a]anthr	7,12-Dimethylbenz[a]anthracene	0.000E+00
0025	110543	Hexane	Hexane	0.000E+00
0026	7440622	Vanadium	Vanadium (fume or dust)	0.000E+00
0027	79345	TetraClEthane	1,1,2,2-Tetrachloroethane	0.000E+00
0028	75343	1,1-DiClEthane	1,1-Dichloroethane	0.000E+00
0029	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0030	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0031	107028	Acrolein	Acrolein	0.000E+00
0032	56235	CCl4	Carbon tetrachloride	0.000E+00
0033	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0034	67663	Chloroform	Chloroform	0.000E+00
0035	106934	EDB	Ethylene dibromide {EDB}	0.000E+00
0036	67561	Methanol	Methanol	0.000E+00
0037	75092	Methylene Chlor	Methylene chloride {Dichloromethane}	0.000E+00
0038	108952	Phenol	Phenol	0.000E+00
0039	100425	Styrene	Styrene	0.000E+00
0040	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0041	79005	1,1,2TriClEthan	1,1,2-Trichloroethane	0.000E+00
0042	542756	1,3-DiClPropene	1,3-Dichloropropene	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF (Inh) (mg/kg-d) ^-1	CancerPF (Oral) (mg/kg-d) ^-1	ChronicREL (Inh) ug/m^3	ChronicREL (Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0003	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0004	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0005	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0006	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0007	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0008	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0009	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0010	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0011	25321226	DiClBenzenes	*	*	*	*	*
0012	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0013	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0014	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0015	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0016	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0017	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0018	7440508	Copper	*	*	*	*	1.00E+02
0019	7440473	Chromium	*	*	*	*	*
0020	7439965	Manganese	*	*	9.00E-02	*	*
0021	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0022	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0023	7782492	Selenium	*	*	2.00E+01	*	*
0024	57976	7,12-DB[a]anthr	2.50E+02	2.50E+02	*	*	*
0025	110543	Hexane	*	*	7.00E+03	*	*
0026	7440622	Vanadium	*	*	*	*	3.00E+01
0027	79345	TetraClEthane	2.00E-01	*	*	*	*
0028	75343	1,1-DiClEthane	5.70E-03	*	*	*	*
0029	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0030	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0031	107028	Acrolein	*	*	3.50E-01	*	2.50E+00
0032	56235	CCl4	1.50E-01	*	4.00E+01	*	1.90E+03
0033	108907	Chlorobenzn	*	*	1.00E+03	*	*
0034	67663	Chloroform	1.90E-02	*	3.00E+02	*	1.50E+02
0035	106934	EDB	2.50E-01	*	8.00E-01	*	*
0036	67561	Methanol	*	*	4.00E+03	*	2.80E+04
0037	75092	Methylene Chlor	3.50E-03	*	4.00E+02	*	1.40E+04
0038	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0039	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0040	75014	Vinyl Chloride	2.70E-01	*	*	*	1.80E+05
0041	79005	1,1,2TriClEthan	5.70E-02	*	*	*	*
0042	542756	1,3-DiClPropene	5.50E-02	*	*	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
 CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=99 PRO=99 STK=99 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 99 EMS (lbs/yr)						
SOURCE MULTIPLIER=1						
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
71432	Benzene	1	0	233	0.0393	
100414	Ethyl Benzene	1	0	924	0.156	
108883	Toluene	1	0	473	0.0796	
1330207	Xylenes	1	0	1220	0.206	
56553	B[a]anthracene	1	0	*	*	
50328	B[a]P	1	0	*	*	
205992	B[b]fluoranthen	1	0	*	*	
207089	B[k]fluoranthen	1	0	*	*	
218019	Chrysene	1	0	*	*	
53703	D[a,h]anthracen	1	0	*	*	
25321226	DiClBenzenes	1	0	*	*	
50000	Formaldehyde	1	0	*	*	
193395	In[1,2,3-cd]pyr	1	0	*	*	
91203	Naphthalene	1	0	*	*	
7440382	Arsenic	1	0	*	*	
7440417	Beryllium	1	0	*	*	
7440439	Cadmium	1	0	*	*	
7440508	Copper	1	0	*	*	
7440473	Chromium	1	0	*	*	
7439965	Manganese	1	0	*	*	
7439976	Mercury	1	0	*	*	
7440020	Nickel	1	0	*	*	
7782492	Selenium	1	0	*	*	
57976	7,12-DB[a]anthr	1	0	*	*	
110543	Hexane	1	0	*	*	
7440622	Vanadium	1	0	*	*	
79345	TetraClEthane	1	0	*	*	
75343	1,1-DiClEthane	1	0	*	*	
106990	1,3-Butadiene	1	0	*	*	
75070	Acetaldehyde	1	0	*	*	
107028	Acrolein	1	0	*	*	
56235	CCl4	1	0	*	*	
108907	Chlorobenzn	1	0	*	*	
67663	Chloroform	1	0	*	*	
106934	EDB	1	0	*	*	
67561	Methanol	1	0	*	*	
75092	Methylene Chlor	1	0	*	*	
108952	Phenol	1	0	*	*	
100425	Styrene	1	0	*	*	
75014	Vinyl Chloride	1	0	*	*	
79005	1,1,2TriClEthan	1	0	*	*	
542756	1,3-DiClPropene	1	0	*	*	

EMISSIONS FOR FACILITY FAC=1 DEV=88 PRO=88 STK=88 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 88 EMS (lbs/yr)

SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.0734	0.0000124
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	0.119	0.00002
1330207	Xylenes	1	0	*	*
56553	B[a]anthracene	1	0	0.000065	0.0000000109
50328	B[a]P	1	0	0.0000419	0.00000000706
205992	B[b]fluoranthen	1	0	0.0000629	0.0000000106
207089	B[k]fluoranthen	1	0	0.0000629	0.0000000106
218019	Chrysene	1	0	0.0000629	0.0000000106
53703	D[a,h]anthracen	1	0	0.0000419	0.00000000706
25321226	DiClBenzenes	1	0	0.0419	0.00000706
50000	Formaldehyde	1	0	2.62	0.000441
193395	In[1,2,3-cd]pyr	1	0	0.0000629	0.0000000106
91203	Naphthalene	1	0	0.0213	0.00000359
7440382	Arsenic	1	0	0.00699	0.00000359
7440417	Beryllium	1	0	0.000419	0.0000000706
7440439	Cadmium	1	0	0.0384	0.00000647
7440508	Copper	1	0	0.0297	0.000005
7440473	Chromium	1	0	0.0489	0.00000824
7439965	Manganese	1	0	0.0133	0.00000224
7439976	Mercury	1	0	0.00908	0.00000153
7440020	Nickel	1	0	0.0734	0.0000124
7782492	Selenium	1	0	0.000839	0.000000141
57976	7,12-DB[a]anthr	1	0	0.000559	0.0000000941
110543	Hexane	1	0	62.9	0.0106
7440622	Vanadium	1	0	0.0804	0.0000135
79345	TetraClEthane	1	0	*	*
75343	1,1-DiClEthane	1	0	*	*
106990	1,3-Butadiene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
107028	Acrolein	1	0	*	*
56235	CCl4	1	0	*	*
108907	Chlorobenzn	1	0	*	*
67663	Chloroform	1	0	*	*
106934	EDB	1	0	*	*
67561	Methanol	1	0	*	*
75092	Methylene Chlor	1	0	*	*
108952	Phenol	1	0	*	*
100425	Styrene	1	0	*	*
75014	Vinyl Chloride	1	0	*	*
79005	1,1,2TriClEthan	1	0	*	*
542756	1,3-DiClPropene	1	0	*	*

EMISSIONS FOR FACILITY FAC=1 DEV=77 PRO=77 STK=77 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 77 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	44.5	0.0125
100414	Ethyl Benzene	1	0	4.01	0.00113
108883	Toluene	1	0	41.2	0.0116
1330207	Xylenes	1	0	18.6	0.00525
56553	B[a]anthracene	1	0	*	*
50328	B[a]P	1	0	*	*
205992	B[b]fluoranthen	1	0	0.0168	0.00000473
207089	B[k]fluoranthen	1	0	*	*
218019	Chrysene	1	0	0.07	0.0000198
53703	D[a,h]anthracen	1	0	*	*
25321226	DiClBenzenes	1	0	*	*
50000	Formaldehyde	1	0	5340	1.51
193395	In[1,2,3-cd]pyr	1	0	*	*
91203	Naphthalene	1	0	7.52	0.00212
7440382	Arsenic	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440508	Copper	1	0	*	*
7440473	Chromium	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7782492	Selenium	1	0	*	*
57976	7,12-DB[a]anthr	1	0	*	*
110543	Hexane	1	0	112	0.0316
7440622	Vanadium	1	0	*	*
79345	TetraClEthane	1	0	0.251	0.00114
75343	1,1-DiClEthane	1	0	2.39	0.000673
106990	1,3-Butadiene	1	0	27	0.00761
75070	Acetaldehyde	1	0	845	0.238
107028	Acrolein	1	0	519	0.147
56235	CCl4	1	0	3.71	0.00105
108907	Chlorobenzn	1	0	3.07	0.000867
67663	Chloroform	1	0	2.88	0.000813
106934	EDB	1	0	4.48	0.00126
67561	Methanol	1	0	253	0.0713
75092	Methylene Chlor	1	0	2.02	0.00057
108952	Phenol	1	0	2.43	0.000684
100425	Styrene	1	0	2.39	0.000673
75014	Vinyl Chloride	1	0	1.51	0.000425
79005	1,1,2TriClEthan	1	0	3.21	0.000907
542756	1,3-DiClPropene	1	0	2.67	0.000754

ACUTE HI REPORT

REC	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX
0001	2.52E-04	3.60E-04	0.00E+00	1.28E-03	0.00E+00	6.31E-02	3.99E-07	9.52E-04	0.00E+00	9.92E-04	4.32E-02	0.00E+00	9.23E-04	6.31E-02
0002	1.75E-04	2.61E-04	0.00E+00	1.05E-03	0.00E+00	6.43E-02	4.07E-07	8.08E-04	0.00E+00	8.48E-04	4.40E-02	0.00E+00	7.88E-04	6.43E-02
0003	1.70E-04	2.49E-04	0.00E+00	9.35E-04	0.00E+00	5.51E-02	3.49E-07	7.08E-04	0.00E+00	7.41E-04	3.77E-02	0.00E+00	6.88E-04	5.51E-02
0004	1.62E-04	2.46E-04	0.00E+00	1.00E-03	0.00E+00	7.29E-02	4.62E-07	7.79E-04	0.00E+00	8.19E-04	4.99E-02	0.00E+00	7.60E-04	7.29E-02
0005	1.60E-04	2.42E-04	0.00E+00	9.87E-04	0.00E+00	6.38E-02	4.04E-07	7.65E-04	0.00E+00	8.04E-04	4.37E-02	0.00E+00	7.47E-04	6.38E-02
0006	1.67E-04	2.46E-04	0.00E+00	9.40E-04	0.00E+00	5.67E-02	3.59E-07	7.15E-04	0.00E+00	7.49E-04	3.88E-02	0.00E+00	6.95E-04	5.67E-02
0007	1.68E-04	2.33E-04	0.00E+00	7.59E-04	0.00E+00	4.41E-02	2.79E-07	5.46E-04	0.00E+00	5.67E-04	3.02E-02	0.00E+00	5.26E-04	4.41E-02
0008	2.21E-04	3.20E-04	0.00E+00	1.15E-03	0.00E+00	8.19E-02	5.19E-07	8.62E-04	0.00E+00	9.01E-04	5.60E-02	0.00E+00	8.36E-04	8.19E-02
0009	1.72E-04	2.59E-04	0.00E+00	1.03E-03	0.00E+00	7.38E-02	4.68E-07	7.91E-04	0.00E+00	8.31E-04	5.05E-02	0.00E+00	7.71E-04	7.38E-02
0010	1.64E-04	2.44E-04	0.00E+00	9.45E-04	0.00E+00	6.51E-02	4.12E-07	7.22E-04	0.00E+00	7.57E-04	4.45E-02	0.00E+00	7.03E-04	6.51E-02
0011	7.19E-06	1.08E-05	0.00E+00	2.49E-05	0.00E+00	1.67E-02	1.07E-07	1.54E-05	0.00E+00	1.67E-05	1.14E-02	0.00E+00	1.46E-05	1.67E-02
0012	1.71E-04	2.50E-04	0.00E+00	9.29E-04	0.00E+00	6.42E-02	4.07E-07	7.01E-04	0.00E+00	7.33E-04	4.39E-02	0.00E+00	6.81E-04	6.42E-02
0013	1.71E-04	2.46E-04	0.00E+00	8.72E-04	0.00E+00	5.88E-02	3.73E-07	6.48E-04	0.00E+00	6.77E-04	4.03E-02	0.00E+00	6.28E-04	5.88E-02
0014	1.46E-04	2.01E-04	0.00E+00	6.15E-04	0.00E+00	4.70E-02	2.98E-07	4.32E-04	0.00E+00	4.48E-04	3.21E-02	0.00E+00	4.15E-04	4.70E-02

Chronic Health Impact Results

This file: C:\HARP\PROJECTS\Rep_Chr_Res_DerOEH_AllRec_AllSrc_AllCh_ByRec_Site.txt

Created by HARP Version 1.4a Build 23.07.00
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 12/17/2009 1:53:20 PM

EXCEPTION REPORT

(there have been no changes or exceptions)

INPUT FILES:

Source-Receptor file: C:\HARP\PROJECTS\DEFAULT.SRC
Averaging period adjustment factors file: not applicable
Emission rates file: database
Site parameters file: C:\Projects\NiCor Energy Underground Nat Gas Storage\Respond to Comments\Revised HRA\project.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: resident
Analysis method: Derived (OEHHA) Method
Health effect: Chronic HI
Receptor(s): All
Sources(s): All
Chemicals(s): All

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.05

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

HUMAN INGESTION

Fraction of ingested leafy vegetable	
from home grown source	0.15
Fraction of ingested exposed vegetable	
from home grown source	0.15
Fraction of ingested protected vegetable	
from home grown source	0.15
Fraction of ingested root vegetable	
from home grown source	0.15

PIGS, CHICKENS AND EGGS

HUMAN INGESTION

Fraction of ingested pig	
from home grown source	1
Fraction of ingested chicken	
from home grown source	1
Fraction of ingested egg	
from home grown source	1

ANIMALS' FEED

Fraction of pigs' feed	
from home grown crop	0.1
Fraction of chickens' feed	
from home grown crop	0.05

SOIL INGESTION

Fraction of pigs' feed	
eaten off the ground	0.1
Fraction of chickens' feed	
eaten off the ground	0.05

PIG FEED COMPOSITION

Fraction of feed that is	
exposed vegetable	0.25
Fraction of feed that is	
leafy vegetable	0.25
Fraction of feed that is	
protected vegetable	0.25
Fraction of feed that is	
root vegetable	0.25

CHICKEN FEED COMPOSITION

Fraction of feed that is exposed vegetable	0.25
Fraction of feed that is leafy vegetable	0.25
Fraction of feed that is protected vegetable	0.25
Fraction of feed that is root vegetable	0.25

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND
			(ug/m ³)	
0001	71432	Benzene	Benzene	0.000E+00
0002	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0003	108883	Toluene	Toluene	0.000E+00
0004	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0005	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0006	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0007	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0008	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0009	218019	Chrysene	Chrysene	0.000E+00
0010	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0011	25321226	DiClBenzenes	Dichlorobenzenes (mixed isomers)	0.000E+00
0012	50000	Formaldehyde	Formaldehyde	0.000E+00
0013	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0014	91203	Naphthalene	Naphthalene	0.000E+00
0015	7440382	Arsenic	Arsenic	0.000E+00
0016	7440417	Beryllium	Beryllium	0.000E+00
0017	7440439	Cadmium	Cadmium	0.000E+00
0018	7440508	Copper	Copper	0.000E+00
0019	7440473	Chromium	Chromium	0.000E+00
0020	7439965	Manganese	Manganese	0.000E+00
0021	7439976	Mercury	Mercury	0.000E+00
0022	7440020	Nickel	Nickel	0.000E+00
0023	7782492	Selenium	Selenium	0.000E+00
0024	57976	7,12-DB[a]anthr	7,12-Dimethylbenz[a]anthracene	0.000E+00
0025	110543	Hexane	Hexane	0.000E+00
0026	7440622	Vanadium	Vanadium (fume or dust)	0.000E+00
0027	79345	TetraClEthane	1,1,2,2-Tetrachloroethane	0.000E+00
0028	75343	1,1-DiClEthane	1,1-Dichloroethane	0.000E+00
0029	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0030	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0031	107028	Acrolein	Acrolein	0.000E+00
0032	56235	CCl4	Carbon tetrachloride	0.000E+00
0033	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0034	67663	Chloroform	Chloroform	0.000E+00
0035	106934	EDB	Ethylene dibromide {EDB}	0.000E+00
0036	67561	Methanol	Methanol	0.000E+00
0037	75092	Methylene Chlor	Methylene chloride {Dichloromethane}	0.000E+00
0038	108952	Phenol	Phenol	0.000E+00
0039	100425	Styrene	Styrene	0.000E+00
0040	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0041	79005	1,1,2TriClEthan	1,1,2-Trichloroethane	0.000E+00
0042	542756	1,3-DiClPropene	1,3-Dichloropropene	0.000E+00

CHEMICAL HEALTH VALUES							
CHEM	CAS	ABBREVIATION	CancerPF (Inh) (mg/kg-d) ^-1	CancerPF (Oral) (mg/kg-d) ^-1	ChronicREL (Inh) ug/m^3	ChronicREL (Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0003	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0004	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0005	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0006	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0007	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0008	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0009	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0010	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0011	25321226	DiClBenzenes	*	*	*	*	*
0012	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0013	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0014	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0015	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0016	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0017	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0018	7440508	Copper	*	*	*	*	1.00E+02
0019	7440473	Chromium	*	*	*	*	*
0020	7439965	Manganese	*	*	9.00E-02	*	*
0021	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0022	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0023	7782492	Selenium	*	*	2.00E+01	*	*
0024	57976	7,12-DB[a]anthr	2.50E+02	2.50E+02	*	*	*
0025	110543	Hexane	*	*	7.00E+03	*	*
0026	7440622	Vanadium	*	*	*	*	3.00E+01
0027	79345	TetraClEthane	2.00E-01	*	*	*	*
0028	75343	1,1-DiClEthane	5.70E-03	*	*	*	*
0029	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0030	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0031	107028	Acrolein	*	*	3.50E-01	*	2.50E+00
0032	56235	CCl4	1.50E-01	*	4.00E+01	*	1.90E+03
0033	108907	Chlorobenzn	*	*	1.00E+03	*	*
0034	67663	Chloroform	1.90E-02	*	3.00E+02	*	1.50E+02
0035	106934	EDB	2.50E-01	*	8.00E-01	*	*
0036	67561	Methanol	*	*	4.00E+03	*	2.80E+04
0037	75092	Methylene Chlor	3.50E-03	*	4.00E+02	*	1.40E+04
0038	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0039	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0040	75014	Vinyl Chloride	2.70E-01	*	*	*	1.80E+05
0041	79005	1,1,2TriClEthan	5.70E-02	*	*	*	*
0042	542756	1,3-DiClPropene	5.50E-02	*	*	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
 CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=99 PRO=99 STK=99 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 99 EMS (lbs/yr)						
SOURCE MULTIPLIER=1						
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
71432	Benzene	1	0	233	0.0393	
100414	Ethyl Benzene	1	0	924	0.156	
108883	Toluene	1	0	473	0.0796	
1330207	Xylenes	1	0	1220	0.206	
56553	B[a]anthracene	1	0	*	*	
50328	B[a]P	1	0	*	*	
205992	B[b]fluoranthen	1	0	*	*	
207089	B[k]fluoranthen	1	0	*	*	
218019	Chrysene	1	0	*	*	
53703	D[a,h]anthracen	1	0	*	*	
25321226	DiClBenzenes	1	0	*	*	
50000	Formaldehyde	1	0	*	*	
193395	In[1,2,3-cd]pyr	1	0	*	*	
91203	Naphthalene	1	0	*	*	
7440382	Arsenic	1	0	*	*	
7440417	Beryllium	1	0	*	*	
7440439	Cadmium	1	0	*	*	
7440508	Copper	1	0	*	*	
7440473	Chromium	1	0	*	*	
7439965	Manganese	1	0	*	*	
7439976	Mercury	1	0	*	*	
7440020	Nickel	1	0	*	*	
7782492	Selenium	1	0	*	*	
57976	7,12-DB[a]anthr	1	0	*	*	
110543	Hexane	1	0	*	*	
7440622	Vanadium	1	0	*	*	
79345	TetraClEthane	1	0	*	*	
75343	1,1-DiClEthane	1	0	*	*	
106990	1,3-Butadiene	1	0	*	*	
75070	Acetaldehyde	1	0	*	*	
107028	Acrolein	1	0	*	*	
56235	CCl4	1	0	*	*	
108907	Chlorobenzn	1	0	*	*	
67663	Chloroform	1	0	*	*	
106934	EDB	1	0	*	*	
67561	Methanol	1	0	*	*	
75092	Methylene Chlor	1	0	*	*	
108952	Phenol	1	0	*	*	
100425	Styrene	1	0	*	*	
75014	Vinyl Chloride	1	0	*	*	
79005	1,1,2TriClEthan	1	0	*	*	
542756	1,3-DiClPropene	1	0	*	*	

EMISSIONS FOR FACILITY FAC=1 DEV=88 PRO=88 STK=88 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 88 EMS (lbs/yr)

SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.0734	0.0000124
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	0.119	0.00002
1330207	Xylenes	1	0	*	*
56553	B[a]anthracene	1	0	0.000065	0.0000000109
50328	B[a]P	1	0	0.0000419	0.00000000706
205992	B[b]fluoranthen	1	0	0.0000629	0.0000000106
207089	B[k]fluoranthen	1	0	0.0000629	0.0000000106
218019	Chrysene	1	0	0.0000629	0.0000000106
53703	D[a,h]anthracen	1	0	0.0000419	0.00000000706
25321226	DiClBenzenes	1	0	0.0419	0.00000706
50000	Formaldehyde	1	0	2.62	0.000441
193395	In[1,2,3-cd]pyr	1	0	0.0000629	0.0000000106
91203	Naphthalene	1	0	0.0213	0.00000359
7440382	Arsenic	1	0	0.00699	0.00000359
7440417	Beryllium	1	0	0.000419	0.0000000706
7440439	Cadmium	1	0	0.0384	0.00000647
7440508	Copper	1	0	0.0297	0.000005
7440473	Chromium	1	0	0.0489	0.00000824
7439965	Manganese	1	0	0.0133	0.00000224
7439976	Mercury	1	0	0.00908	0.00000153
7440020	Nickel	1	0	0.0734	0.0000124
7782492	Selenium	1	0	0.000839	0.000000141
57976	7,12-DB[a]anthr	1	0	0.000559	0.0000000941
110543	Hexane	1	0	62.9	0.0106
7440622	Vanadium	1	0	0.0804	0.0000135
79345	TetraClEthane	1	0	*	*
75343	1,1-DiClEthane	1	0	*	*
106990	1,3-Butadiene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
107028	Acrolein	1	0	*	*
56235	CCl4	1	0	*	*
108907	Chlorobenzn	1	0	*	*
67663	Chloroform	1	0	*	*
106934	EDB	1	0	*	*
67561	Methanol	1	0	*	*
75092	Methylene Chlor	1	0	*	*
108952	Phenol	1	0	*	*
100425	Styrene	1	0	*	*
75014	Vinyl Chloride	1	0	*	*
79005	1,1,2TriClEthan	1	0	*	*
542756	1,3-DiClPropene	1	0	*	*

EMISSIONS FOR FACILITY FAC=1 DEV=77 PRO=77 STK=77 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 77 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	44.5	0.0125
100414	Ethyl Benzene	1	0	4.01	0.00113
108883	Toluene	1	0	41.2	0.0116
1330207	Xylenes	1	0	18.6	0.00525
56553	B[a]anthracene	1	0	*	*
50328	B[a]P	1	0	*	*
205992	B[b]fluoranthen	1	0	0.0168	0.00000473
207089	B[k]fluoranthen	1	0	*	*
218019	Chrysene	1	0	0.07	0.0000198
53703	D[a,h]anthracen	1	0	*	*
25321226	DiClBenzenes	1	0	*	*
50000	Formaldehyde	1	0	5340	1.51
193395	In[1,2,3-cd]pyr	1	0	*	*
91203	Naphthalene	1	0	7.52	0.00212
7440382	Arsenic	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440508	Copper	1	0	*	*
7440473	Chromium	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7782492	Selenium	1	0	*	*
57976	7,12-DB[a]anthr	1	0	*	*
110543	Hexane	1	0	112	0.0316
7440622	Vanadium	1	0	*	*
79345	TetraClEthane	1	0	0.251	0.00114
75343	1,1-DiClEthane	1	0	2.39	0.000673
106990	1,3-Butadiene	1	0	27	0.00761
75070	Acetaldehyde	1	0	845	0.238
107028	Acrolein	1	0	519	0.147
56235	CCl4	1	0	3.71	0.00105
108907	Chlorobenzn	1	0	3.07	0.000867
67663	Chloroform	1	0	2.88	0.000813
106934	EDB	1	0	4.48	0.00126
67561	Methanol	1	0	253	0.0713
75092	Methylene Chlor	1	0	2.02	0.00057
108952	Phenol	1	0	2.43	0.000684
100425	Styrene	1	0	2.39	0.000673
75014	Vinyl Chloride	1	0	1.51	0.000425
79005	1,1,2TriClEthan	1	0	3.21	0.000907
542756	1,3-DiClPropene	1	0	2.67	0.000754

CHRONIC HI REPORT

REC	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX
0001	4.80E-04	6.47E-04	0.00E+00	6.27E-04	7.08E-06	0.00E+00	7.66E-06	4.11E-07	1.15E-04	3.13E-06	1.49E-03	4.80E-04	6.99E-05	1.49E-03
0002	2.87E-04	3.78E-04	0.00E+00	3.67E-04	3.71E-06	0.00E+00	4.06E-06	2.45E-07	6.84E-05	1.90E-06	8.98E-04	2.87E-04	3.74E-05	8.98E-04
0003	3.87E-04	5.03E-04	0.00E+00	4.90E-04	4.53E-06	0.00E+00	5.02E-06	3.31E-07	9.18E-05	3.77E-06	1.57E-03	3.87E-04	4.66E-05	1.57E-03
0004	2.22E-03	2.79E-03	0.00E+00	2.73E-03	1.96E-05	0.00E+00	2.28E-05	1.90E-06	5.20E-04	4.30E-05	1.54E-02	2.22E-03	2.16E-04	1.54E-02
0005	8.92E-04	1.14E-03	0.00E+00	1.11E-03	9.11E-06	0.00E+00	1.03E-05	7.63E-07	2.10E-04	1.31E-05	4.93E-03	8.92E-04	9.67E-05	4.93E-03
0006	4.37E-04	5.65E-04	0.00E+00	5.50E-04	4.87E-06	0.00E+00	5.43E-06	3.74E-07	1.03E-04	4.37E-06	1.81E-03	4.37E-04	5.06E-05	1.81E-03
0007	2.32E-04	2.97E-04	0.00E+00	2.90E-04	2.41E-06	0.00E+00	2.70E-06	1.99E-07	5.48E-05	2.11E-06	8.93E-04	2.32E-04	2.54E-05	8.93E-04
0008	5.75E-04	7.54E-04	0.00E+00	7.33E-04	7.18E-06	0.00E+00	7.88E-06	4.92E-07	1.37E-04	3.65E-06	1.75E-03	5.75E-04	7.28E-05	1.75E-03
0009	3.55E-04	4.65E-04	0.00E+00	4.52E-04	4.36E-06	0.00E+00	4.81E-06	3.04E-07	8.44E-05	3.17E-06	1.35E-03	3.55E-04	4.44E-05	1.35E-03
0010	5.03E-04	6.44E-04	0.00E+00	6.28E-04	5.19E-06	0.00E+00	5.84E-06	4.30E-07	1.19E-04	5.32E-06	2.16E-03	5.03E-04	5.48E-05	2.16E-03
0011	1.36E-05	1.68E-05	0.00E+00	1.65E-05	9.42E-08	0.00E+00	1.22E-07	1.17E-08	3.17E-06	7.24E-07	2.32E-04	1.36E-05	1.15E-06	2.32E-04
0012	3.94E-04	5.10E-04	0.00E+00	4.97E-04	4.45E-06	0.00E+00	4.94E-06	3.37E-07	9.33E-05	3.53E-06	1.50E-03	3.94E-04	4.60E-05	1.50E-03
0013	3.07E-04	3.93E-04	0.00E+00	3.83E-04	3.20E-06	0.00E+00	3.59E-06	2.62E-07	7.23E-05	3.40E-06	1.37E-03	3.07E-04	3.37E-05	1.37E-03
0014	1.72E-04	2.17E-04	0.00E+00	2.12E-04	1.54E-06	0.00E+00	1.78E-06	1.48E-07	4.04E-05	2.87E-06	1.05E-03	1.72E-04	1.69E-05	1.05E-03

Cancer Risk Results

This file: C:\HARP\PROJECTS\Rep_Can_70yr_DerOEH_AllRec_AllSrc_AllCh_ByRec_Site.txt

Created by HARP Version 1.4a Build 23.07.00
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 12/17/2009 1:54:39 PM

EXCEPTION REPORT

(there have been no changes or exceptions)

INPUT FILES:

Source-Receptor file: C:\HARP\PROJECTS\DEFAULT.SRC
Averaging period adjustment factors file: not applicable
Emission rates file: database
Site parameters file: C:\Projects\NiCor Energy Underground Nat Gas Storage\Respond to Comments\Revised HRA\project.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method: Derived (OEHHA) Method
Health effect: Cancer Risk
Receptor(s): All
Sources(s): All
Chemicals(s): All

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s)	0.05
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DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

HUMAN INGESTION

Fraction of ingested leafy vegetable	
from home grown source	0.15
Fraction of ingested exposed vegetable	
from home grown source	0.15
Fraction of ingested protected vegetable	
from home grown source	0.15
Fraction of ingested root vegetable	
from home grown source	0.15

PIGS, CHICKENS AND EGGS

HUMAN INGESTION

Fraction of ingested pig	
from home grown source	1
Fraction of ingested chicken	
from home grown source	1
Fraction of ingested egg	
from home grown source	1

ANIMALS' FEED

Fraction of pigs' feed	
from home grown crop	0.1
Fraction of chickens' feed	
from home grown crop	0.05

SOIL INGESTION

Fraction of pigs' feed	
eaten off the ground	0.1
Fraction of chickens' feed	
eaten off the ground	0.05

PIG FEED COMPOSITION

Fraction of feed that is	
exposed vegetable	0.25
Fraction of feed that is	
leafy vegetable	0.25
Fraction of feed that is	
protected vegetable	0.25
Fraction of feed that is	
root vegetable	0.25

CHICKEN FEED COMPOSITION

Fraction of feed that is exposed vegetable	0.25
Fraction of feed that is leafy vegetable	0.25
Fraction of feed that is protected vegetable	0.25
Fraction of feed that is root vegetable	0.25

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND
			(ug/m ³)	
0001	71432	Benzene	Benzene	0.000E+00
0002	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0003	108883	Toluene	Toluene	0.000E+00
0004	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0005	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0006	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0007	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0008	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0009	218019	Chrysene	Chrysene	0.000E+00
0010	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0011	25321226	DiClBenzenes	Dichlorobenzenes (mixed isomers)	0.000E+00
0012	50000	Formaldehyde	Formaldehyde	0.000E+00
0013	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0014	91203	Naphthalene	Naphthalene	0.000E+00
0015	7440382	Arsenic	Arsenic	0.000E+00
0016	7440417	Beryllium	Beryllium	0.000E+00
0017	7440439	Cadmium	Cadmium	0.000E+00
0018	7440508	Copper	Copper	0.000E+00
0019	7440473	Chromium	Chromium	0.000E+00
0020	7439965	Manganese	Manganese	0.000E+00
0021	7439976	Mercury	Mercury	0.000E+00
0022	7440020	Nickel	Nickel	0.000E+00
0023	7782492	Selenium	Selenium	0.000E+00
0024	57976	7,12-DB[a]anthr	7,12-Dimethylbenz[a]anthracene	0.000E+00
0025	110543	Hexane	Hexane	0.000E+00
0026	7440622	Vanadium	Vanadium (fume or dust)	0.000E+00
0027	79345	TetraClEthane	1,1,2,2-Tetrachloroethane	0.000E+00
0028	75343	1,1-DiClEthane	1,1-Dichloroethane	0.000E+00
0029	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0030	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0031	107028	Acrolein	Acrolein	0.000E+00
0032	56235	CCl4	Carbon tetrachloride	0.000E+00
0033	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0034	67663	Chloroform	Chloroform	0.000E+00
0035	106934	EDB	Ethylene dibromide {EDB}	0.000E+00
0036	67561	Methanol	Methanol	0.000E+00
0037	75092	Methylene Chlor	Methylene chloride {Dichloromethane}	0.000E+00
0038	108952	Phenol	Phenol	0.000E+00
0039	100425	Styrene	Styrene	0.000E+00
0040	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0041	79005	1,1,2TriClEthan	1,1,2-Trichloroethane	0.000E+00
0042	542756	1,3-DiClPropene	1,3-Dichloropropene	0.000E+00

CHEMICAL HEALTH VALUES							
CHEM	CAS	ABBREVIATION	CancerPF (Inh) (mg/kg-d) ^-1	CancerPF (Oral) (mg/kg-d) ^-1	ChronicREL (Inh) ug/m^3	ChronicREL (Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0003	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0004	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0005	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0006	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0007	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0008	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0009	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0010	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0011	25321226	DiClBenzenes	*	*	*	*	*
0012	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0013	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0014	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0015	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0016	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0017	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0018	7440508	Copper	*	*	*	*	1.00E+02
0019	7440473	Chromium	*	*	*	*	*
0020	7439965	Manganese	*	*	9.00E-02	*	*
0021	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0022	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0023	7782492	Selenium	*	*	2.00E+01	*	*
0024	57976	7,12-DB[a]anthr	2.50E+02	2.50E+02	*	*	*
0025	110543	Hexane	*	*	7.00E+03	*	*
0026	7440622	Vanadium	*	*	*	*	3.00E+01
0027	79345	TetraClEthane	2.00E-01	*	*	*	*
0028	75343	1,1-DiClEthane	5.70E-03	*	*	*	*
0029	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0030	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0031	107028	Acrolein	*	*	3.50E-01	*	2.50E+00
0032	56235	CCl4	1.50E-01	*	4.00E+01	*	1.90E+03
0033	108907	Chlorobenzn	*	*	1.00E+03	*	*
0034	67663	Chloroform	1.90E-02	*	3.00E+02	*	1.50E+02
0035	106934	EDB	2.50E-01	*	8.00E-01	*	*
0036	67561	Methanol	*	*	4.00E+03	*	2.80E+04
0037	75092	Methylene Chlor	3.50E-03	*	4.00E+02	*	1.40E+04
0038	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0039	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0040	75014	Vinyl Chloride	2.70E-01	*	*	*	1.80E+05
0041	79005	1,1,2TriClEthan	5.70E-02	*	*	*	*
0042	542756	1,3-DiClPropene	5.50E-02	*	*	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
 CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=99 PRO=99 STK=99 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 99 EMS (lbs/yr)						
SOURCE MULTIPLIER=1						
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
71432	Benzene	1	0	233	0.0393	
100414	Ethyl Benzene	1	0	924	0.156	
108883	Toluene	1	0	473	0.0796	
1330207	Xylenes	1	0	1220	0.206	
56553	B[a]anthracene	1	0	*	*	
50328	B[a]P	1	0	*	*	
205992	B[b]fluoranthen	1	0	*	*	
207089	B[k]fluoranthen	1	0	*	*	
218019	Chrysene	1	0	*	*	
53703	D[a,h]anthracen	1	0	*	*	
25321226	DiClBenzenes	1	0	*	*	
50000	Formaldehyde	1	0	*	*	
193395	In[1,2,3-cd]pyr	1	0	*	*	
91203	Naphthalene	1	0	*	*	
7440382	Arsenic	1	0	*	*	
7440417	Beryllium	1	0	*	*	
7440439	Cadmium	1	0	*	*	
7440508	Copper	1	0	*	*	
7440473	Chromium	1	0	*	*	
7439965	Manganese	1	0	*	*	
7439976	Mercury	1	0	*	*	
7440020	Nickel	1	0	*	*	
7782492	Selenium	1	0	*	*	
57976	7,12-DB[a]anthr	1	0	*	*	
110543	Hexane	1	0	*	*	
7440622	Vanadium	1	0	*	*	
79345	TetraClEthane	1	0	*	*	
75343	1,1-DiClEthane	1	0	*	*	
106990	1,3-Butadiene	1	0	*	*	
75070	Acetaldehyde	1	0	*	*	
107028	Acrolein	1	0	*	*	
56235	CCl4	1	0	*	*	
108907	Chlorobenzn	1	0	*	*	
67663	Chloroform	1	0	*	*	
106934	EDB	1	0	*	*	
67561	Methanol	1	0	*	*	
75092	Methylene Chlor	1	0	*	*	
108952	Phenol	1	0	*	*	
100425	Styrene	1	0	*	*	
75014	Vinyl Chloride	1	0	*	*	
79005	1,1,2TriClEthan	1	0	*	*	
542756	1,3-DiClPropene	1	0	*	*	

EMISSIONS FOR FACILITY FAC=1 DEV=88 PRO=88 STK=88 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 88 EMS (lbs/yr)

SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.0734	0.0000124
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	0.119	0.00002
1330207	Xylenes	1	0	*	*
56553	B[a]anthracene	1	0	0.000065	0.0000000109
50328	B[a]P	1	0	0.0000419	0.00000000706
205992	B[b]fluoranthen	1	0	0.0000629	0.0000000106
207089	B[k]fluoranthen	1	0	0.0000629	0.0000000106
218019	Chrysene	1	0	0.0000629	0.0000000106
53703	D[a,h]anthracen	1	0	0.0000419	0.00000000706
25321226	DiClBenzenes	1	0	0.0419	0.00000706
50000	Formaldehyde	1	0	2.62	0.000441
193395	In[1,2,3-cd]pyr	1	0	0.0000629	0.0000000106
91203	Naphthalene	1	0	0.0213	0.00000359
7440382	Arsenic	1	0	0.00699	0.00000359
7440417	Beryllium	1	0	0.000419	0.0000000706
7440439	Cadmium	1	0	0.0384	0.00000647
7440508	Copper	1	0	0.0297	0.000005
7440473	Chromium	1	0	0.0489	0.00000824
7439965	Manganese	1	0	0.0133	0.00000224
7439976	Mercury	1	0	0.00908	0.00000153
7440020	Nickel	1	0	0.0734	0.0000124
7782492	Selenium	1	0	0.000839	0.000000141
57976	7,12-DB[a]anthr	1	0	0.000559	0.0000000941
110543	Hexane	1	0	62.9	0.0106
7440622	Vanadium	1	0	0.0804	0.0000135
79345	TetraClEthane	1	0	*	*
75343	1,1-DiClEthane	1	0	*	*
106990	1,3-Butadiene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
107028	Acrolein	1	0	*	*
56235	CCl4	1	0	*	*
108907	Chlorobenzn	1	0	*	*
67663	Chloroform	1	0	*	*
106934	EDB	1	0	*	*
67561	Methanol	1	0	*	*
75092	Methylene Chlor	1	0	*	*
108952	Phenol	1	0	*	*
100425	Styrene	1	0	*	*
75014	Vinyl Chloride	1	0	*	*
79005	1,1,2TriClEthan	1	0	*	*
542756	1,3-DiClPropene	1	0	*	*

EMISSIONS FOR FACILITY FAC=1 DEV=77 PRO=77 STK=77 NAME=UNDERGROUND NATURAL GAS STORAGE STACK 77 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m ³)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	44.5	0.0125
100414	Ethyl Benzene	1	0	4.01	0.00113
108883	Toluene	1	0	41.2	0.0116
1330207	Xylenes	1	0	18.6	0.00525
56553	B[a]anthracene	1	0	*	*
50328	B[a]P	1	0	*	*
205992	B[b]fluoranthen	1	0	0.0168	0.00000473
207089	B[k]fluoranthen	1	0	*	*
218019	Chrysene	1	0	0.07	0.0000198
53703	D[a,h]anthracen	1	0	*	*
25321226	DiClBenzenes	1	0	*	*
50000	Formaldehyde	1	0	5340	1.51
193395	In[1,2,3-cd]pyr	1	0	*	*
91203	Naphthalene	1	0	7.52	0.00212
7440382	Arsenic	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440508	Copper	1	0	*	*
7440473	Chromium	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7782492	Selenium	1	0	*	*
57976	7,12-DB[a]anthr	1	0	*	*
110543	Hexane	1	0	112	0.0316
7440622	Vanadium	1	0	*	*
79345	TetraClEthane	1	0	0.251	0.00114
75343	1,1-DiClEthane	1	0	2.39	0.000673
106990	1,3-Butadiene	1	0	27	0.00761
75070	Acetaldehyde	1	0	845	0.238
107028	Acrolein	1	0	519	0.147
56235	CCl4	1	0	3.71	0.00105
108907	Chlorobenzn	1	0	3.07	0.000867
67663	Chloroform	1	0	2.88	0.000813
106934	EDB	1	0	4.48	0.00126
67561	Methanol	1	0	253	0.0713
75092	Methylene Chlor	1	0	2.02	0.00057
108952	Phenol	1	0	2.43	0.000684
100425	Styrene	1	0	2.39	0.000673
75014	Vinyl Chloride	1	0	1.51	0.000425
79005	1,1,2TriClEthan	1	0	3.21	0.000907
542756	1,3-DiClPropene	1	0	2.67	0.000754

CANCER RISK REPORT

REC	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	2.08E-07	3.75E-09	8.98E-10	0.00E+00	0.00E+00	0.00E+00	1.10E-08	0.00E+00	0.00E+00	4.81E-13	2.12E-11	5.93E-13	2.23E-11	1.56E-08	2.23E-07
0002	1.11E-07	2.24E-09	5.36E-10	0.00E+00	0.00E+00	0.00E+00	6.55E-09	0.00E+00	0.00E+00	2.87E-13	1.27E-11	3.54E-13	1.33E-11	9.34E-09	1.20E-07
0003	1.47E-07	3.03E-09	7.25E-10	0.00E+00	0.00E+00	0.00E+00	8.90E-09	0.00E+00	0.00E+00	3.90E-13	1.72E-11	4.81E-13	1.81E-11	1.27E-08	1.60E-07
0004	8.49E-07	1.76E-08	4.20E-09	0.00E+00	0.00E+00	0.00E+00	5.19E-08	0.00E+00	0.00E+00	2.28E-12	1.00E-10	2.81E-12	1.05E-10	7.39E-08	9.23E-07
0005	3.40E-07	7.04E-09	1.68E-09	0.00E+00	0.00E+00	0.00E+00	2.07E-08	0.00E+00	0.00E+00	9.08E-13	4.00E-11	1.12E-12	4.20E-11	2.95E-08	3.69E-07
0006	1.61E-07	3.43E-09	8.20E-10	0.00E+00	0.00E+00	0.00E+00	1.01E-08	0.00E+00	0.00E+00	4.41E-13	1.94E-11	5.44E-13	2.04E-11	1.43E-08	1.75E-07
0007	7.92E-08	1.82E-09	4.35E-10	0.00E+00	0.00E+00	0.00E+00	5.34E-09	0.00E+00	0.00E+00	2.34E-13	1.03E-11	2.89E-13	1.08E-11	7.60E-09	8.68E-08
0008	2.15E-07	4.48E-09	1.07E-09	0.00E+00	0.00E+00	0.00E+00	1.31E-08	0.00E+00	0.00E+00	5.76E-13	2.53E-11	7.10E-13	2.66E-11	1.87E-08	2.34E-07
0009	1.38E-07	2.78E-09	6.65E-10	0.00E+00	0.00E+00	0.00E+00	8.15E-09	0.00E+00	0.00E+00	3.57E-13	1.57E-11	4.41E-13	1.65E-11	1.16E-08	1.50E-07
0010	1.77E-07	3.95E-09	9.44E-10	0.00E+00	0.00E+00	0.00E+00	1.16E-08	0.00E+00	0.00E+00	5.08E-13	2.24E-11	6.26E-13	2.35E-11	1.65E-08	1.93E-07
0011	8.15E-09	1.14E-10	2.66E-11	0.00E+00	0.00E+00	0.00E+00	3.39E-10	0.00E+00	0.00E+00	1.49E-14	6.57E-13	1.84E-14	6.91E-13	4.80E-10	8.63E-09
0012	1.43E-07	3.09E-09	7.38E-10	0.00E+00	0.00E+00	0.00E+00	9.05E-09	0.00E+00	0.00E+00	3.97E-13	1.75E-11	4.89E-13	1.84E-11	1.29E-08	1.56E-07
0013	1.10E-07	2.41E-09	5.76E-10	0.00E+00	0.00E+00	0.00E+00	7.07E-09	0.00E+00	0.00E+00	3.10E-13	1.37E-11	3.82E-13	1.43E-11	1.01E-08	1.20E-07
0014	6.27E-08	1.37E-09	3.25E-10	0.00E+00	0.00E+00	0.00E+00	4.01E-09	0.00E+00	0.00E+00	1.76E-13	7.76E-12	2.17E-13	8.15E-12	5.71E-09	6.84E-08