

Appendix B

Air Emission Calculations

Appendix B

Whittier Oil Field Air Emission Summary

Construction Emissions

Activity	Peak Day Emissions (lb/day)						Total Emission (tons)									
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4	CO2	
Pad Clearing																
Construction Equipment	2.7	10.2	24.4	0.0	1.0	1.0	0.03	0.10	0.24	0.00	0.01	0.01	0.00	0.00	25	
Fugitive Dust Emissions					14.5	3.0					0.14	0.02				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	2.7	10.2	24.4	0.0	15.5	4.0	0.03	0.10	0.24	0.00	0.15	0.03	0.00	0.00	25	
Offsite Mobile Emissions	1.1	6.6	9.3	0.0	0.5	0.4	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	6	
Total	3.8	16.8	33.7	0.0	15.9	4.4	0.03	0.15	0.27	0.00	0.15	0.03	0.00	0.00	31	
Grading and Access Road Construction																
Combustion Equipment	10.6	37.3	96.1	0.1	4.0	3.9	1.27	4.48	11.53	0.01	0.47	0.47	0.02	0.08	1,246	
Fugitive Dust Emissions					52.9	11.0					3.17	0.03				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	10.6	37.3	96.1	0.1	56.8	14.9	1.27	4.48	11.53	0.01	3.65	0.50	0.02	0.08	1,246	
Offsite Mobile Emissions	7.2	29.5	88.2	0.1	4.2	3.7	0.43	1.73	5.27	0.01	0.25	0.22	0.01	0.03	542	
Total	17.8	66.9	184.3	0.2	61.0	18.6	1.70	6.21	16.79	0.02	3.90	0.72	0.03	0.10	1,788	
Facility Construction																
Combustion Equipment	8.0	20.3	44.2	0.1	2.6	2.6	0.84	2.54	5.53	0.01	0.32	0.32	0.01	0.04	578	
Fugitive Dust Emissions					18.3	3.8					0.62	0.03				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	8.0	20.3	44.2	0.1	20.9	6.4	0.84	2.54	5.53	0.01	0.95	0.35	0.01	0.04	578	
Offsite Mobile Emissions	3.6	20.2	33.3	0.0	1.6	1.4	0.25	1.74	1.59	0.00	0.08	0.07	0.02	0.04	293	
Total	11.6	40.5	77.6	0.1	22.5	7.8	1.08	4.27	7.12	0.01	1.03	0.42	0.03	0.08	871	
Pipeline Construction																
Combustion Equipment	6.1	19.0	37.7	0.0	2.4	2.4	0.53	1.71	3.39	0.00	0.22	0.22	0.00	0.02	339	
Fugitive Dust Emissions					2.2	0.5					0.00	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	6.1	19.0	37.7	0.0	4.7	2.9	0.53	1.71	3.39	0.00	0.22	0.22	0.00	0.02	339	
Offsite Mobile Emissions	1.5	8.3	14.9	0.0	0.7	0.6	0.14	0.83	1.18	0.00	0.06	0.05	0.01	0.02	168	
Total	7.6	27.3	52.5	0.1	5.4	3.5	0.66	2.54	4.57	0.01	0.28	0.27	0.01	0.04	507	
SCAQMD Regional Construction Thresholds (lbs/day)	75	550	100	150	150	55										
SCAQMD Localized Construction Thresholds (lbs/day)	-	1554	126	-	37	12										
Significant Impact Regional?	No	No	Yes	No	No	No										
Significant Impact Local?	No	No	No	No	Yes	Yes										

Operational Emissions

Activity	Peak Day Emissions (lb/day)						Total Emission (tons)									
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4	CO2	
Drilling Emissions Testing																
Combustion Equipment and Fugitives	3.7	12.3	70.2	0.1	3.7	3.7	0.21	0.72	3.40	0.00	0.19	0.19	0.01	0.03	411	
Fugitive Dust Emissions					4.7	1.0					0.20	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	3.7	12.3	70.2	0.1	8.4	4.6	0.21	0.72	3.40	0.00	0.38	0.19	0.01	0.03	411	
Offsite Mobile Emissions	2.3	12.0	22.8	0.0	1.1	1.0	0.05	0.33	0.35	0.00	0.02	0.02	0.00	0.01	60	
Total	6.0	24.3	93.0	0.1	9.5	5.6	0.26	1.06	3.75	0.01	0.40	0.20	0.01	0.03	470	
Testing Emissions																
Combustion Equipment and Fugitives	10.4	12.3	45.8	0.2	2.6	2.6	0.33	0.74	2.75	0.01	0.16	0.16	0.00	0.12	2,534	
Fugitive Dust Emissions					1.9	0.4					0.12	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	10.4	12.3	45.8	0.2	4.6	3.0	0.33	0.74	2.75	0.01	0.27	0.16	0.00	0.12	2,534	
Offsite Mobile Emissions	0.7	3.7	7.9	0.0	0.4	0.3	0.04	0.22	0.48	0.00	0.02	0.02	0.00	0.00	56	
Total	11.1	16.0	53.7	0.2	4.9	3.3	0.38	0.96	3.22	0.01	0.30	0.18	0.01	0.13	2,590	
Operational Emissions while Drilling																
Combustion Equipment and Fugitives	46.0	210.1	780.3	3.6	45.0	44.1	1.21	2.42	4.17	0.04	0.52	0.51	0.02	1.33	8,301	
Workover Emissions	0.5	1.6	6.5	0.0	0.2	0.2	0.07	0.21	0.85	0.00	0.03	0.03	0.00	0.01	94	
Drilling Emissions	3.7	12.3	70.2	0.1	3.7	3.7	0.87	2.93	13.78	0.02	0.76	0.75	0.02	0.10	1,666	
<i>Subtotal: Stationary Eq, Workovers and Drilling</i>	50.2	224.0	857.0	3.7	48.9	47.9	2.15	5.57	18.80	0.06	1.30	1.29	0.04	1.44	10,061	
Offsite Mobile Emissions	3.4	19.7	30.1	0.0	1.5	1.3	0.3	2.5	1.9	0.0	0.1	0.1	0.0	0.1	397	
Total	53.6	243.7	887.1	3.7	50.4	49.2	2.48	8.06	20.73	0.07	1.40	1.37	0.06	1.50	10,458	
Operational Emissions with Re-drills only (after 5 years)																
Combustion Equipment and Fugitives	46.0	210.1	780.3	3.6	45.0	44.1	1.2	2.4	4.2	0.0	0.5	0.5	0.0	1.3	8,301	
Workover Emissions	0.5	1.6	6.5	0.0	0.2	0.2	0.1	0.2	0.8	0.0	0.0	0.0	0.0	0.0	94	
Drilling Emissions	3.7	12.3	70.2	0.1	3.7	3.7	0.1	0.4	1.7	0.0	0.1	0.1	0.0	0.0	205	
<i>Subtotal: Stationary Eq, Workovers and Drilling</i>	50.2	224.0	857.0	3.7	48.9	47.9	1.39	3.00	6.72	0.04	0.64	0.63	0.02	1.35	8,601	
Offsite Mobile Emissions	3.4	19.7	30.1	0.0	1.5	1.3	0.2	1.3	0.7	0.0	0.0	0.0	0.0	0.0	185	
Total	53.6	243.7	887.1	3.7	50.4	49.2	1.55	4.31	7.39	0.05	0.67	0.66	0.03	1.38	8,786	
SCAQMD Regional Operations Thresholds (lbs/day)	75	550	100	150	150	55										
SCAQMD Localized Operations Thresholds (lbs/day)	-	1554	126	-	9	3										
Significant Impact Regional?	No	No	Yes	No	No	No										
Significant Impact Local?	No	No	Yes	No	Yes	Yes										

Note: Local significance impacts compared to only stationary emissions

Appendix B

GHG Emission Summary

Activity	N2O, tons	CH4, tons	CO2, tons	CO2e, metric tonnes
Construction, tons				
Pad Clearing Emissions	0.00	0.00	31	28
Grading and Access Road Construction Emissions	0.03	0.10	1,788	1,619
Facility Construction Emissions	0.03	0.08	871	793
Pipeline Construction Emissions	0.01	0.04	507	461
<i>Construction Total</i>				<i>2,901</i>
Operations - one time, tons				
Drilling Emissions - Testing	0.01	0.03	470	426
Testing Emissions	0.01	0.13	2,590	2,336
<i>Operations - one time total, tons</i>				<i>2,762</i>
Operations while Drilling, tons/yr				
Stationary Equipment	0.02	1.33	8,301	7,500
Workover Emissions	0.00	0.01	94	85
Drilling Emissions	0.02	0.10	1,666	1,507
Offsite Mobile Emissions	0.03	0.06	397	366
Offsite Electrical Generation	0.01	0.13	7,523	6,777
<i>Total</i>				<i>16,235</i>
Operations while re-Drilling, tons/yr				
Stationary Equipment	0.02	1.33	8,301	7,500
Workover Emissions	0.00	0.01	94	85
Drilling Emissions	0.00	0.01	205	186
Offsite Mobile Emissions	0.01	0.03	185	172
Offsite Electrical Generation	0.01	0.13	7,523	6,777
<i>Total</i>				<i>14,720</i>

Toxic Air Emissions Summary Peak and Average Year

Compound	CAS	Ops Drilling Annual Emiss, lbs	Ops reDrill Annual Emiss, lbs
1,2,4-Trimethylbenzene	95636	10.6	3.0
Acetaldehyde	75070	145.2	39.2
Acrolein	107028	7.8	2.6
Ammonia	7664417	0.0	0.0
Arsenic and Compounds (inorganic)	7440382	0.8	0.2
Benzene	71432	72.3	43.5
Butadiene [1,3]	106990	3.7	1.0
Cadmium	7440439	6.1	1.3
Chlorine	7782505	52.3	11.3
Copper	7440508	3.8	0.8
Diesel exhaust particulates	9901	1558.5	337.9
Ethyl benzene	100414	82.2	77.8
Formaldehyde	50000	346.1	134.0
Hexane	110543	29.8	27.6
Hydrogen sulfide	7783064	0.0	0.0
Lead compounds (inorganic)	7439921	6.4	1.4
Manganese	7439965	6.1	1.3
Mercury	7439976	4.6	1.0
Methanol	67561	0.6	0.2
Methyl ethyl ketone (2-Butanone)	78933	28.7	7.4
Naphthalene [PAH, POM]	91203	2.2	1.0
Nickel	7440020	2.9	0.6
PAHs, total, w/o individ. components reported [PAH, PO]	1151	7.7	2.1
Phosphorus	7723140	19.3	4.2
Propylene	115071	50.4	13.0
Selenium	7782492	1.5	0.3
Styrene	100425	1.1	0.3
Toluene	108883	47.5	26.3
Xylenes	1210	29.1	14.1
Zinc	7440666	66.6	14.4

Appendix B

Whittier Operational Emission Calculations

Source Code	Equipment	Location	Annual Fuel Use, Throughput, or Count	Fuel, units	Peak Day Hours	Incl in Peak Day?	Total Annual Days	Standing losses (lb/yr)	Emission Factors (lb/unit)										Peak Daily Emissions (lb/day)					Total Annual Emission (tons)																				
									VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N ₂ O	Methane	CO ₂	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N ₂ O	Meth	CO ₂												
Processing Site Combustion Sources																																												
1.1	Gas Plant Flare	Gas Plant	50	Gas, mmscf	24	1	8.3	-	7.0	35.0	130.0	0.6	7.5	7.3	0.2	2.3	120000	42.00	210	780	3.60	45.00	44.06	0.18	0.88	3.25	0.02	0.19	0.18	0.01	0.06	3.000												
1.1a	Gas Plant Flare pilot	Gas Plant	0.7	Gas, mmscf	24	1	365	-	7.0	35.0	130.0	0.6	7.5	7.3	0.2	2.3	120000	0.01	0.07	0.26	0.00	0.02	0.01	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	44												
1.2	Gas Plant DEA Reboiler	Gas Plant	70.9	Gas, mmscf	24	0	365	-	7.0	35.0	12.4	0.6	7.5	7.3	0.2	2.3	120000	1.36	6.80	2.40	0.12	1.46	1.43	0.25	1.24	0.44	0.02	0.27	0.26	0.01	0.08	4.253												
1.3	Gas Plant Thermal Oxidizer	Gas Plant	15.9	Gas, mmscf	24	0	365	-	7.0	35.0	48.0	0.6	7.5	7.3	0.2	2.3	120000	0.31	1.53	2.09	0.03	0.33	0.32	0.06	0.28	0.38	0.00	0.06	0.06	0.00	0.02	956												
1.4	EG Regenerator	Gas Plant	0.80	Gas, mmscf	24	0	365	-	7.0	35.0	130.0	0.6	7.5	7.3	0.2	2.3	120000	0.02	0.08	0.28	0.00	0.02	0.02	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	48												
Processing Site Tank Fugitive Emissions																																												
2.1	Wash tank, 5,368 bbl	Oil Processing	153300	Crude thru, kgal	24	1	365	277	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.031	0.22	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05												
2.2	Shipping Tank1, 11,184 bbl	Oil Processing	51100	Crude thru, kgal	24	1	365	325	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.025	0.07	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01												
2.3	Shipping Tank2, 11,184 bbl	Oil Processing	51100	Crude thru, kgal	24	1	365	325	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.025	0.07	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01												
2.4	Shipping Tank3, 11,184 bbl	Oil Processing	51100	Crude thru, kgal	24	1	365	325	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.025	0.07	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01												
2.5	Reject tank, 2,416 bbl	Oil Processing	153300	Crude thru, kgal	24	1	365	238	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.053	0.042	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01													
2.6	Clarifier, 1,074 bbl	Water Processing	110376	Fluid thru, kgal	24	1	365	35	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.007	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01												
2.7	Filtered water tank, 7,892 bbl	Water Processing	110376	Fluid thru, kgal	24	1	365	29	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.003	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
2.8	Skim drain tank, 2,416 bbl	Water Processing	110376	Fluid thru, kgal	24	1	365	24	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.004	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00												
Processing Site Component Fugitive Emissions																																												
3.1	Valves in Vapor Space - Gas Plant	Gas Plant	2200	Gas, number	24	1	365	-	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.183	0.144	0.66	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.16												
3.2	Pumps in light liquid - Gas Plant	Gas Plant	9	Gas, number	24	1	365	-	5.081	0.000	0.000	0.000	0.000	0.000	0.000	8.434	6.656	0.13	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03												
3.3	Compressors in vap rec - Gas Plant	Gas Plant	12	Gas, number	24	1	365	-	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.210	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
3.4	PRV to atm - Gas Plant	Gas Plant	0	Gas, number	24	1	365	-	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.210	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
3.5	Connectors/Flanges - Gas Plant	Gas Plant	5000	Gas, number	24	1	365	-	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.026	0.27	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.07												
3.7	Others - Gas Plant	Gas Plant	500	Gas, number	24	1	365	-	1.180	0.000	0.000	0.000	0.000	0.000	0.000	1.959	1.546	1.62	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.39												
Well Area Well Heads																																												
4.1	Well heads - production	Well Area	52	Gas, number	24	1	365	-	0.700	0.000	0.000	0.000	0.000	0.000	0.000	1.162	0.917	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02												
4.2	Well heads - injection	Well Area	8	Gas, number	24	1	365	-	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.365	0.288	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
Well Area Component Fugitive Emissions																																												
5.1	Valves in Vapor Space	Well Area	624	Gas, number	24	1	365	-	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.183	0.144	0.19	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.04												
5.2	Pumps in light liquid	Well Area	3	Gas, number	24	1	365	-	5.081	0.000	0.000	0.000	0.000	0.000	0.000	8.434	6.656	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01												
5.3	Compressors in vap rec	Well Area	3	Gas, number	24	1	365	-	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.210	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
5.4	PRV to atm	Well Area	9	Gas, number	24	1	365	-	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.210	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
5.5	Connectors/Flanges	Well Area	1248	Gas, number	24	1	365	-	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.026	0.07	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02													
5.6	Others	Well Area	104	Gas, number	24	1	365	-	1.180	0.000	0.000	0.000	0.000	0.000	0.000	1.959	1.546	0.34	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.10	0.08													
Totals																		46.0	210.1	780.3	3.6	45.0	44.1	1.21	2.42	4.17	0.04	0.52	0.51	0.02	1.33	8.301												

- 1) EF based on tanks calc for working loss only. Includes 98% control eff with fugitives being sucked back into VRU and gas stream.
- 2) Control Eff on tanks --> 0.98
- 3) Gas flare annual use based on flaring for 200 hours
- 4) Weight fraction CO₂/VOC (from Honolulu terrace well 7) 1.31 Well 7 has 20 mole% CO₂
- 5) Weight fraction meth/VOC (from Honolulu terrace well 7) 1.66 Well 7 has 69 mole% Methane
- 6) Component counts for wellheads based on Baldwin Hills: assumes 12 valve leak points per wellhead, 24 connectors/flanges leak points per wellhead
- 7) Component counts for gas plant based on Montebello Hills Oilfield SCAMQMD permit and P&IDs, 6 mmscfd
- 8) Flare based on gas plant capacity and a flare rating of 1100 btu/scf, as per Brycon letter
- 9) Fuel HV assumed to be --> 917 btu/scf as per Toth email on CO₂ content and 5 mmscfd of sales gas
- 10) Produced gas HV -->
- 11) Thermal oxidizer size of --> 2.0 mmbtu/hr as per Brycon letter, 2 mmbtu/hr assumed for the thermal oxidizer
- 12) DEA reboiler size of --> 8.9 mmbtu/hr for DEA reboiler, as per applicant P&IDs
- 13) Diesel CO₂ emission factor based on AP-42 for diesel, assuming 137,000 btu per gallon and 164 lbs CO₂/mmbtu (22.468 lbs CO₂/gal diesel)
- 14) Natural gas combustion (Flare and heater) CO₂ emission factor based on AP-42 for external combustion
- 15) CO₂ content of produced gas estimated based on Honolulu Terrace samples
- 16) Well heads injection based on EF for a two vapor service valves 0.002 mmscfd
- 17) Flare pilot size -->
- 18) DEA Reboiler Nox factor based on Brycon Calculations from Matrix
- 19) Thermal oxidizer Nox factor based on 35 ppm limit, 3% oxygen and 1100 btu/scf with 40 CFR 60, Appendix A, Method 19 and Table 19-1
- 20) Tank emission factors based on crude oil fluid and the EPA Tanks version 409d program with default assumptions and tank sizes as per Applicant P&IDs
- 21) PM_{2.5} fraction of PM₁₀ based on SCAQMD CEIDAR Table appendix A for external combustion of petroleum and industrial process heaters--> 0.979
- 22) Assumed 4 leak paths per compressor stage
- 23) Pressure relief at pad site assumed to vent to atm. Pressure relief at processing assumed to vent to flare
- 24) Emission factors for fugitive components based on Montebello Oilfield SCAQMD permit and annual emissions report
- 25) Peak day assumes full flaring of all process gas
- 26) Flare EF based on Montebello Oilfield permit as submitted to the SCAQMD for non-refinery flares
- 27) N₂O and Meth EF for combustion from Emission Factors from Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Appendix A, CARB 2007.
- 28) EG regenerator size 0.1 mmbtu/hr
- 29) Total gas consumed per year, percentage of that produced 6.3 %
- 30) Amount of throughput to reject tank assumed to be 10% of throughput

Appendix B

Drilling and Completion Emission Calculations for testing phase, 3 wells

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)								Total Emissions (ton)								Fuel Use
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	
Draw works	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.28	4.28	24.38	0.03	1.28	1.27	0.06	0.19	1.10	0.00	0.06	0.06	0.00	0.01	135	16,796
Mud pump	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.28	4.28	24.38	0.03	1.28	1.27	0.06	0.19	1.10	0.00	0.06	0.06	0.00	0.01	135	16,796
Generator	1	2	475	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.13	3.76	21.44	0.03	1.13	1.12	0.05	0.17	0.96	0.00	0.05	0.05	0.00	0.01	119	14,774
Crane	0	1	120	0.43	0.511	1.798	3.022	0.003	0.279	0.276	0.004	0.021	245	3	270	0.17	0.61	1.03	0.00	0.10	0.09	0.01	0.03	0.05	0.00	0.00	0.00	0.00	0.00	4	669
Loader	0	1	108	0.54	0.586	2.203	3.555	0.004	0.325	0.322	0.004	0.021	307	3	270	0.23	0.85	1.37	0.00	0.13	0.12	0.01	0.04	0.06	0.00	0.01	0.01	0.00	0.00	5	756
Welding Machine	0	1	45	0.45	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	6	540	0.30	0.77	0.70	0.00	0.07	0.07	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.00	3	525
Forklift	0	1	120	0.30	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	4	360	0.09	0.38	0.56	0.00	0.05	0.05	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	2	622
Backhoe	0	1	108	0.55	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	4	360	0.26	1.13	1.67	0.00	0.12	0.12	0.01	0.05	0.08	0.00	0.01	0.01	0.00	0.00	8	1,026
Total															3.7	12	70	0.1	3.7	3.7	0.21	0.72	3.40	0.00	0.19	0.19	0.01	0.03	411	51,965	

- Emissions include drill rig mobilization, demobilization, drilling operations, and well completion.
- Fuel usage conversion is calculated on 0.0511 gallons per BHP-hr, as per AP-42
- Emission factors for draw works, mud pump and generator assume Tier 3 engines for Kenai 14 rig, as per Kenai Drilling data
- Emission and load factors for Crane, Forklift, Backhoe, loader, and welding machine from URBEMIS year 2011
- Totals for daily emissions are for peak day equipment only.
- Annual Drilling days 90 based on 3 wells at 30 days per well
- Not all equipment is operating each day.
- Assumes 24 hrs/day operations for drawworks, mud pump and generator
- Rig equipment load factor based on actual rig fuel use as reported by Kenai Drilling for April 1 - June 6, 2010 operations on Kenai rig 14
- Crane, loader, etc hours based on actual average hours used at Baldwin Hills Oilfield EIR
- Average fuel use per day 577 gallons
- PM2.5 to PM10 ration for diesel engines 0.991 from SCAQMD CEIDARS Tables for distillate combustion

Drilling and Completion Emission Calculations for operational drilling phase, 30 days per well

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)								Total Emissions (ton)								Fuel Use
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	
Draw works	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	8760	1.28	4.28	24.38	0.03	1.28	1.27	0.23	0.78	4.45	0.01	0.23	0.23	0.01	0.03	546	68,118
Mud pump	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	8760	1.28	4.28	24.38	0.03	1.28	1.27	0.23	0.78	4.45	0.01	0.23	0.23	0.01	0.03	546	68,118
Generator	1	2	475	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	8760	1.13	3.76	21.44	0.03	1.13	1.12	0.21	0.69	3.91	0.01	0.21	0.20	0.01	0.03	481	59,918
Crane	0	1	120	0.43	0.511	1.798	3.022	0.003	0.279	0.276	0.004	0.021	245	3	1095	0.17	0.61	1.03	0.00	0.10	0.09	0.03	0.11	0.19	0.00	0.02	0.02	0.00	0.00	15	2,712
Loader	0	1	108	0.54	0.586	2.203	3.555	0.004	0.325	0.322	0.004	0.021	307	3	1095	0.23	0.85	1.37	0.00	0.13	0.12	0.04	0.15	0.25	0.00	0.02	0.02	0.00	0.00	22	3,065
Welding Machine	0	1	45	0.45	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	6	2190	0.30	0.77	0.70	0.00	0.07	0.07	0.05	0.14	0.13	0.00	0.01	0.01	0.00	0.00	12	2,129
Forklift	0	1	120	0.30	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	4	1460	0.09	0.38	0.56	0.00	0.05	0.05	0.02	0.07	0.10	0.00	0.01	0.01	0.00	0.00	10	2,523
Backhoe	0	1	108	0.55	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	4	1460	0.26	1.13	1.67	0.00	0.12	0.12	0.05	0.21	0.31	0.00	0.02	0.02	0.00	0.00	33	4,163
Total															3.7	12	70	0.1	3.7	3.7	0.87	2.93	13.78	0.02	0.76	0.75	0.02	0.10	1666	210,746	

- Annual Drilling days 365 based on continuous drilling at 30 days per well

Re-Drilling Emission Calculations for operational re-drilling phase, 15 days per well

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)								Total Emissions (ton)								Fuel Use
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	
Draw works	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	1080	1.28	4.28	24.38	0.03	1.28	1.27	0.03	0.10	0.55	0.00	0.03	0.03	0.00	0.00	67	8,398
Mud pump	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	1080	1.28	4.28	24.38	0.03	1.28	1.27	0.03	0.10	0.55	0.00	0.03	0.03	0.00	0.00	67	8,398
Generator	1	2	475	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	1080	1.13	3.76	21.44	0.03	1.13	1.12	0.03	0.08	0.48	0.00	0.03	0.03	0.00	0.00	59	7,387
Crane	0	1	120	0.43	0.511	1.798	3.022	0.003	0.279	0.276	0.004	0.021	245	3	135	0.17	0.61	1.03	0.00	0.10	0.09	0.00	0.01	0.02	0.00	0.00	0.00	0.00	2	334	
Loader	0	1	108	0.54	0.586	2.203	3.555	0.004	0.325	0.322	0.004	0.021	307	3	135	0.23	0.85	1.37	0.00	0.13	0.12	0.01	0.02	0.03	0.00	0.00	0.00	0.00	3	378	
Welding Machine	0	1	45	0.45	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	6	270	0.30	0.77	0.70	0.00	0.07	0.07	0.01	0.02	0.02	0.00	0.00	0.00	0.00	2	262	
Forklift	0	1	120	0.30	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	4	180	0.09	0.38	0.56	0.00	0.05	0.05	0.00	0.01	0.01	0.00	0.00	0.00	0.00	1	311	
Backhoe	0	1	108	0.55	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	4	180	0.26	1.13	1.67	0.00	0.12	0.12	0.01	0.03	0.04	0.00	0.00	0.00	0.00	4	513	
Total															3.7	12	70	0.1	3.7	3.7	0.11	0.36	1.70	0.00	0.09	0.09	0.00	0.01	205	25,982	

- Annual re-Drilling days 45 assumes 3 redrill per year and 15 days per redrill

Workover Emission Calculations for operational phase, 52 production wells

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)								Total Emissions (ton)								Fuel Use
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	
Generator	1	1	200	0.25	0.290	0.925	3.796	0.005	0.109	0.108	0.004	0.021	421	12	3120	0.38	1.22	5.01	0.01	0.14	0.14	0.05	0.16	0.65	0.00	0.02	0.02	0.00	0.00	72	7,488
Off highway truck	1	1	200	0.10	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	12	3120	0.16	0.42	1.52	0.00	0.05	0.05	0.02	0.05	0.20	0.00	0.01	0.01	0.00	0.00	22	2,995
Total															0.5	1.6	6.5	0.0	0.2	0.2	0.07	0.21	0.85	0.00	0.03	0.03	0.00	0.01	94	10,483	

- Annual workover days 260 based on one service per production well each year for 5 days, as per applicant submittal

Appendix B

Offsite Mobile Emissions

Source	Vehicle Type	Emission Factors (lbs/mile)									Peak Trips per day	Average Trips per day	Length of Trip (miles)	Peak Day Emissions, lbs/day						Total Emissions, Tons/yr								
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂				VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂
Well Area Clearing/Utilities Installation																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	12	11	27	0.32	3.09	0.32	0.00	0.03	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	4
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	8	1.4	27	0.70	2.73	8.90	0.01	0.42	0.37	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	2
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Total Well Pad Clearing														1.10	6.59	9.31	0.01	0.46	0.39	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	6
Well Drilling Test																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01	25
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.03	0.10	0.33	0.00	0.02	0.01	0.00	0.00	33
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.05	0.33	0.35	0.00	0.02	0.02	0.00	0.01	60
Testing																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	4	4	27	0.11	1.03	0.11	0.00	0.01	0.01	0.01	0.06	0.01	0.00	0.00	0.00	0.00	0.00	7
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	7	7	27	0.61	2.39	7.79	0.01	0.37	0.33	0.04	0.14	0.47	0.00	0.02	0.02	0.00	0.00	47
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	1	1	27	0.03	0.26	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2
Total Testing														0.75	3.68	7.93	0.01	0.38	0.33	0.04	0.22	0.48	0.00	0.02	0.02	0.00	0.00	56
Facility Grading/North Access Road Construction																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	9	6.5	27	0.24	2.32	0.24	0.00	0.02	0.01	0.01	0.10	0.01	0.00	0.00	0.00	0.00	0.00	11
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	1	1.1	27	0.09	0.34	1.11	0.00	0.05	0.05	0.01	0.02	0.07	0.00	0.00	0.00	0.00	0.00	7
Trucks - Soil Hauling	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	78	77.6	27	6.83	26.60	86.82	0.08	4.14	3.64	0.41	1.59	5.18	0.00	0.25	0.02	0.01	0.02	522
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	1	1	27	0.03	0.26	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2
Total Facility Grading														7.18	29.52	88.20	0.09	4.22	3.70	0.43	1.73	5.27	0.01	0.25	0.22	0.01	0.03	542
Facility Construction																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	37	39	27	0.98	9.53	0.99	0.01	0.08	0.05	0.13	1.26	0.13	0.00	0.01	0.01	0.01	0.03	142
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	29	10.5	27	2.54	9.89	32.28	0.03	1.54	1.35	0.11	0.45	1.46	0.00	0.07	0.06	0.00	0.01	147
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4
Total Facility Construction														3.60	20.20	33.35	0.04	1.63	1.41	0.25	1.74	1.59	0.00	0.08	0.07	0.02	0.04	293
Pipeline Construction																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	12	14	27	0.32	3.09	0.32	0.00	0.03	0.02	0.05	0.45	0.05	0.00	0.00	0.00	0.01	0.01	51
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	13	8.1	27	1.14	4.43	14.47	0.01	0.69	0.61	0.09	0.35	1.13	0.00	0.05	0.05	0.00	0.00	113
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	4
Total Facility Construction														1.53	8.30	14.87	0.02	0.72	0.63	0.14	0.83	1.18	0.00	0.06	0.05	0.01	0.02	168
Operations																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	20	20.9	27	0.53	5.15	0.53	0.01	0.05	0.03	0.10	0.98	0.10	0.00	0.01	0.01	0.01	0.03	111
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	6	1.9	27	0.53	2.05	6.68	0.01	0.32	0.28	0.03	0.12	0.39	0.00	0.02	0.02	0.00	0.00	39
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	2	1	27	0.05	0.52	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5
Total Operations														1.11	7.71	7.27	0.01	0.37	0.31	0.14	1.15	0.49	0.00	0.03	0.02	0.01	0.03	156
Well Drilling Operations																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.09	0.89	0.09	0.00	0.01	0.00	0.01	0.02	101
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.11	0.41	1.34	0.00	0.06	0.06	0.00	0.01	135
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.20	1.35	1.44	0.00	0.07	0.06	0.01	0.03	241
Well Drilling Operations Re-drills																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.01	0.11	0.01	0.00	0.00	0.00	0.00	0.00	12
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.11	0.05	0.17	0.00	0.01	0.01	0.00	0.00	17
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.02	0.17	0.18	0.00	0.01	0.01	0.00	0.00	30
Truck Transport of 50% of the Crude Volume during Pipeline Shutdown - upset condition																												
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	34	34	25	2.80	10.90	35.57	0.03	1.70	1.49	0.06	0.25	0.80	0.00	0.04	0.03	0.00	0.00	81
Total Well Drilling Test														2.80	10.90	35.57	0.03	1.70	1.49	0.06	0.25	0.80	0.00	0.04	0.03	0.00	0.00	81

- Emission Factors from SCAQMD Highest (Most Conservative) EMFAC 2007 emission factors for on-road vehicles.
- Length of trip is assumed to be round trip distances, based on URBEMIS default values for LA County, commercial urban commute
- Well pad clearing days 25
- Well drilling test days 90
- Testing days 120
- Well pad grading/access rd days 120
- Facility construction days 250 for a 50 week year
- Pipeline construction days 180
- Re-drills, annual days 45
- Operations assumes 365 days per year
- CH₄ emission factors from USEPA for running operations. Climate Leader Greenhouse Gas Inventory Protocol, Core Module Guidance. Direct Emissions from Mobile Combustion Sources. October 2004.

Appendix B

Whittier Construction Equipment Emission Calculations

Equipment	BHP	Number	Load Factor	Peak Day ?	Emission Factors (g/bhp-hr)								Hours per Day	Total Days	Emissions (lb/day)						Total Emission (tons)										
					VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4			CO2	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4	CO2	Fuel Use
Site Clearing																															
Grader	250	1	0.61	1	0.336	0.949	3.344	0.004	0.122	0.121	0.004	0.021	347	6	20	0.68	1.91	6.73	0.01	0.25	0.24	0.01	0.02	0.07	0.00	0.00	0.00	7	935		
Bulldozer	400	1	0.59	1	0.441	2.063	3.853	0.003	0.163	0.162	0.004	0.021	336	6	20	1.37	6.43	12.00	0.01	0.51	0.50	0.01	0.06	0.12	0.00	0.01	0.01	0.00	10	1,447	
Water Truck	300	1	0.57	1	0.282	0.840	2.529	0.003	0.094	0.093	0.004	0.021	324	6	20	0.64	1.90	5.71	0.01	0.21	0.21	0.01	0.02	0.06	0.00	0.00	0.00	7	1,049		
Totals																2.69	10.23	24.44	0.02	0.97	0.96	0.03	0.10	0.24	0.00	0.01	0.01	0.00	25	3,431	
Pad and Access Road Grading																															
Grader	250	1	0.61	1	0.336	0.949	3.344	0.004	0.122	0.121	0.004	0.021	347	6	240	0.68	1.91	6.73	0.01	0.25	0.24	0.08	0.23	0.81	0.00	0.03	0.03	0.00	0.01	84	11,222
Bulldozer	400	1	0.59	1	0.441	2.063	3.853	0.003	0.163	0.162	0.004	0.021	336	6	240	1.37	6.43	12.00	0.01	0.51	0.50	0.16	0.77	1.44	0.00	0.06	0.06	0.00	0.01	125	17,366
Scrapper	700	1	0.72	1	0.446	1.785	4.179	0.004	0.165	0.164	0.004	0.021	410	6	240	2.97	11.88	27.80	0.03	1.10	1.09	0.36	1.43	3.34	0.00	0.13	0.13	0.00	0.02	327	37,086
Backhoe	108	1	0.55	1	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	5	240	0.33	1.42	2.09	0.00	0.15	0.15	0.04	0.17	0.25	0.00	0.02	0.02	0.00	0.00	27	3,642
Loader	350	2	0.55	1	0.227	0.732	2.251	0.004	0.080	0.079	0.004	0.021	313	8	240	1.54	4.96	15.25	0.03	0.54	0.54	0.18	0.60	1.83	0.00	0.07	0.06	0.00	0.02	254	37,773
Roller	120	1	0.56	1	0.608	2.233	3.782	0.004	0.330	0.327	0.004	0.021	319	4	240	0.36	1.32	2.24	0.00	0.20	0.19	0.04	0.16	0.27	0.00	0.02	0.02	0.00	0.00	23	3,297
Tamper	120	1	0.59	1	0.726	2.467	4.154	0.004	0.401	0.397	0.004	0.021	336	4	240	0.45	1.54	2.59	0.00	0.25	0.25	0.05	0.18	0.31	0.00	0.03	0.03	0.00	0.00	25	3,473
Water truck	300	1	0.57	1	0.282	0.840	2.529	0.003	0.094	0.093	0.004	0.021	324	6	240	0.64	1.90	5.71	0.01	0.21	0.21	0.08	0.23	0.69	0.00	0.03	0.03	0.00	0.01	88	12,583
Dump truck	250	3	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	8	240	2.27	6.00	21.64	0.03	0.75	0.75	0.27	0.72	2.60	0.00	0.09	0.09	0.00	0.02	293	41,943
Totals																10.61	37.35	96.05	0.12	3.95	3.92	1.27	4.48	11.53	0.01	0.47	0.47	0.02	0.08	1,246	168,385
Facility Construction																															
Crane	120	2	0.43	1	0.511	1.798	3.022	0.003	0.279	0.276	0.004	0.021	245	6	250	0.70	2.45	4.12	0.00	0.38	0.38	0.09	0.31	0.51	0.00	0.05	0.05	0.00	0.00	42	7,910
Welder	45	4	0.45	1	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	7	250	1.40	3.59	3.29	0.00	0.33	0.33	0.17	0.45	0.41	0.00	0.04	0.04	0.00	0.00	40	7,243
Forklift	120	4	0.3	1	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	6	250	0.56	2.30	3.37	0.00	0.32	0.32	0.07	0.29	0.42	0.00	0.04	0.04	0.00	0.00	41	11,038
Backhoe	108	1	0.55	1	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	4	250	0.26	1.13	1.67	0.00	0.12	0.12	0.03	0.14	0.21	0.00	0.02	0.01	0.00	0.00	23	3,035
Manlift	120	2	0.3	1	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	6	250	0.28	1.15	1.68	0.00	0.16	0.16	0.04	0.14	0.21	0.00	0.02	0.02	0.00	0.00	20	5,519
Air Comp Truck	250	1	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	6	250	0.57	1.50	5.41	0.01	0.19	0.19	0.07	0.19	0.68	0.00	0.02	0.02	0.00	0.00	76	10,923
Water truck	300	1	0.57	1	0.282	0.840	2.529	0.003	0.094	0.093	0.004	0.021	324	4	250	0.42	1.26	3.81	0.00	0.14	0.14	0.05	0.16	0.48	0.00	0.02	0.02	0.00	0.00	61	8,738
Dump truck	250	2	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	4	250	0.76	2.00	7.21	0.01	0.25	0.25	0.09	0.25	0.90	0.00	0.03	0.03	0.00	0.01	102	14,564
Concrete truck	300	2	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	2	250	0.45	1.20	4.33	0.01	0.15	0.15	0.06	0.15	0.54	0.00	0.02	0.02	0.00	0.00	61	8,738
Flatbed truck	250	1	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	6	250	0.57	1.50	5.41	0.01	0.19	0.19	0.07	0.19	0.68	0.00	0.02	0.02	0.00	0.00	76	10,923
Paver	120	1	0.62	1	0.672	2.234	4.010	0.004	0.355	0.352	0.004	0.021	301	6	250	0.66	2.19	3.94	0.00	0.35	0.35	0.08	0.27	0.49	0.00	0.04	0.04	0.00	0.00	37	5,703
Asphalt Fug	5.2			1	2.620	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	8	10	1.35	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0	0	
Totals																7.98	20.29	44.23	0.06	2.58	2.56	0.84	2.54	5.53	0.01	0.32	0.32	0.01	0.04	578	94,333
Pipeline Construction																															
Trenchers	120	1	0.75	1	0.940	3.145	5.701	0.005	0.491	0.487	0.004	0.021	427	8	180	1.49	4.98	9.03	0.01	0.78	0.77	0.13	0.45	0.81	0.00	0.07	0.07	0.00	0.00	61	6,623
Backhoe	108	2	0.55	1	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	8	180	1.05	4.54	6.69	0.01	0.48	0.48	0.09	0.41	0.60	0.00	0.04	0.04	0.00	0.00	65	8,742
Water truck	300	1	0.57	1	0.282	0.840	2.529	0.003	0.094	0.093	0.004	0.021	324	8	180	0.85	2.53	7.61	0.01	0.28	0.28	0.08	0.23	0.69	0.00	0.03	0.03	0.00	0.01	88	12,583
Dump truck	250	0	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	8	180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	
Welder	45	2	0.45	1	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	8	180	0.80	2.05	1.88	0.00	0.19	0.19	0.07	0.18	0.17	0.00	0.02	0.02	0.00	0.00	16	2,980
Flatbed truck	250	1	0.57	1	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	8	180	0.76	2.00	7.21	0.01	0.25	0.25	0.07	0.18	0.65	0.00	0.02	0.02	0.00	0.00	73	10,486
Paver	120	1	0.62	1	0.672	2.234	4.010	0.004	0.355	0.352	0.004	0.021	301	8	180	0.88	2.93	5.25	0.01	0.46	0.46	0.08	0.26	0.47	0.00	0.04	0.04	0.00	0.00	36	5,475
Asphalt Fug	1.0			1	2.620	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	8	10	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	
Totals																6.09	19.03	37.67	0.04	2.45	2.43	0.53	1.71	3.39	0.00	0.22	0.22	0.00	0.02	339	46,888

- Emission Factors from URBEMIS Off-road Diesel Equipment Year 2011
- Percent PM₁₀ and PM_{2.5} emissions from SCAQMD Updated CEIDARS Table with PM2.5 Fractions (Appendix A).
- Fuel use based on EPA 0.0511 gal/bhp-hr, AP-42
- Engine load factor based on URBEMIS defaults
- Engine size and hours per day based on Applicant data in the PD
- peak day based on estimated equipment use.
- PM_{2.5} to PM₁₀ ratio for diesel engines 0.991 from SCAQMD CEIDARS Tables for distillate combustion
- Asphalt fugitive emissions based on URBEMIS EF of 2.62 lbs ROC/acre
- Construction asphalt acreage based on 20' road width and 1.2 miles road length from project site to landfill boundary plus Catalina 26' road width and 3,760' length
- Pipeline asphalt acreage based on 2.8 miles of 3' wide

Appendix B

Pad Clearing Fugitive Dust Emission Calculations

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.16	acre/day	20	26.4	lbs/acre	4.18	0.87	83.69	22.98
Fill dumping	411	tons/day	20	0.009	lbs/ton	3.73	0.78	74.57	0.01
Travel on dirt roads, trucks	3.79	vehicle-miles	20	0.32	lbs/vehicle-miles	1.22	0.25	24.35	0.08
Travel on dirt roads, passenger vehicle	7.10	vehicle-miles	20	0.07	lbs/vehicle-miles	0.47	0.10	9.36	0.01
Disturbed area	0.16	acre/day	20	26.4	lbs/acre	4.18	0.87	83.69	22.98
Fill Storage Piles	0.10	acres	10	7.04	lbs/day/acre	0.70	0.15	7.04	1.03
Total						14.49	3.01	283	47.08

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	8	Peak day of 8 vehicles, as per PD
average number of vehicles per day, passenger vehicles	15	Peak day of 15 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total of well area
Total days of grading	20	5 days per week for 4 weeks
Total days of disturbed area	20	5 days per week for 4 weeks
Total cut and fill, yr ³	21,100	total cut and fill for assumes 10% of project total
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Test Drilling Fugitive Dust Emission Calculations

test drilling would be performed with the roads and pads still dirt and would therefore create fugitive dust emissions

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	26.4	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	0.00	tons/day	0	0.009	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	9.47	vehicle-miles	84	0.32	lbs/vehicle-miles	3.04	0.63	255.63	0.20
Travel on dirt roads, passenger vehicle	9.47	vehicle-miles	84	0.07	lbs/vehicle-miles	0.62	0.13	52.40	0.01
Disturbed area	0.04	acre/day	84	26.4	lbs/acre	1.00	0.21	83.69	5.47
Fill Storage Piles	0.00	acres	10	7.04	lbs/day/acre	0.00	0.00	0.00	0.00
Total						4.66	0.97	392	5.68

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	20	Peak day of 20 vehicles, as per PD
average number of vehicles per day, passenger vehicles	20	Peak day of 20 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total well area of project site
Total days of grading	0	no grading
Total days of disturbed area	84	3 months of drilling, every day
Total cut and fill, yr ³	0	total cut and fill for west and central pad areas, 10% of for site clearing
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Appendix B

Testing Fugitive Dust Emission Calculations

testing would be performed with the roads and pads still dirt and would therefore create fugitive dust emissions

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	26.4	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	0.00	tons/day	0	0.009	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	3.31	vehicle-miles	120	0.32	lbs/vehicle-miles	1.07	0.22	127.81	0.07
Travel on dirt roads, passenger vehicle	2.37	vehicle-miles	120	0.07	lbs/vehicle-miles	0.16	0.03	18.72	0.00
Disturbed area	0.03	acre/day	120	26.4	lbs/acre	0.70	0.15	83.69	3.83
Fill Storage Piles	0.00	acres	10	7.04	lbs/day/acre	0.00	0.00	0.00	0.00
Total						1.92	0.40	230	3.90

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on

following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	7	Peak day of 7 vehicles, as per PD
average number of vehicles per day, passenger vehicles	5	Peak day of 5 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total well area of project site
Total days of grading	0	no grading
Total days of disturbed area	120	4 months testing
Total cut and fill, yr ³	0	total cut and fill for west and central pad areas, 10% of for site clearing
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Grading Fugitive Dust Emission Calculations

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.17	acre/day	120	26.4	lbs/acre	4.39	0.91	526.42	24.09
Fill dumping	4,108	tons/day	120	0.009	lbs/ton	37.28	7.76	4,474.06	0.07
Travel on dirt roads, trucks	9.47	vehicle-miles	120	0.32	lbs/vehicle-miles	3.04	0.63	365.18	0.20
Travel on dirt roads, passenger vehicle	3.55	vehicle-miles	120	0.07	lbs/vehicle-miles	0.23	0.05	28.07	0.00
Disturbed area	0.17	acre/day	120	26.4	lbs/acre	4.39	0.91	526.42	24.09
Fill Storage Piles	0.50	acres	120	7.04	lbs/day/acre	3.52	0.73	422.47	5.16
Total						52.86	10.99	6,343	53.61

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on

following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	20	peak day pad grading, in PD
average number of vehicles per day, passenger vehicles	7.5	peak day pad grading, in PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	19.94	total sum of pad areas disturbed + temp construction parking and staging + half of access road
Total days of grading	120	5 days per week for 6 month
Total days of disturbed area	120	5 days per week for 6 month
Total cut and fill, yr ³	211,000	total cut and fill sum for all pads and processing area and access road
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Appendix B

Facilities Construction Fugitive Dust Emission Calculations

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.24	acre/day	68	26.4	lbs/acre	6.33	1.32	430.32	34.75
Fill dumping	0	tons/day	68	0.009	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	13.73	vehicle-miles	68	0.32	lbs/vehicle-miles	4.41	0.92	300	0.29
Travel on dirt roads, passenger vehicle	18.94	vehicle-miles	68	0.07	lbs/vehicle-miles	1.25	0.26	85	0.02
Disturbed area	0.24	acre/day	68	26.4	lbs/acre	6.33	1.32	430.32	34.75
Fill Storage Piles	0.00	acres	10	7.04	lbs/day/acre	0.00	0.00	0.00	0.00
Total						18.32	3.81	1,246	69.81

Notes for the Table

Emission factors taken from SCAQMD CEQA document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	29	peak day facility construction, in PD
average number of vehicles per day, passenger vehicles	40	peak day facility construction, in PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500)
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	16.30	total sum of pad areas disturbed + temp construction parking and staging+access road
Total days of grading	68	68 days for foundation completion, assumed dirt areas during this time
Total days of disturbed area	68	68 days for foundation completion, assumed dirt areas during this time
Total cut and fill, yr ³	0	All cut and fill conducted in grading stage
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Pipeline Construction Fugitive Dust Emission Calculations

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	26.4	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	169	tons/day	0	0.009	lbs/ton	1.53	0.32	0.00	0.00
Travel on dirt roads, trucks	0.00	vehicle-miles	180	7.71	lbs/vehicle-miles	0.00	0.00	0	0.00
Travel on dirt roads, passenger vehicle	0.00	vehicle-miles	0	1.58	lbs/vehicle-miles	0.00	0.00	0.00	0.00
Disturbed area	0.00	acre/day	180	26.4	lbs/acre	0.00	0.00	0.37	0.01
Fill Storage Piles	0.10	acres	10	7.04	lbs/day/acre	0.70	0.15	7.04	1.03
Total						2.24	0.47	7	1.05

Notes for the Table

Emission factors taken from SCAQMD CEQA document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	24	
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	13	peak day pipeline construction, in PD
average number of vehicles per day, passenger vehicles	15	peak day pipeline construction, in PD
distance of travel for each vehicle on site, ft	0	no distance on dirt roads
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	0.01	pipeline ROW 3' by an estimated 200' per day
Total days of grading	0	days for pipeline installation, as per PD
Total days of disturbed area	180	days for pipeline installation, as per PD
Total cut and fill, yr ³	8,683	based on length of pipelines and trench width and depth
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

Appendix B

Health Risk Assessment Inputs

Source	Location	Peak Hour Activity	Peak year Activity	70 year Activity	U.S. Nat'l 83 z11	U.S. Nat'l 83 z11	U.S. Nat'l 83 z11	Height_m	Dia_m	Temp_K	U.S. Nat'l 83 z11	Velocity_m/s	Type
1.1	Gas Plant Flare	operations	operations	operations	407085.7	3759498.7	12.2	1.8	180	3.7	Point		
1.2	Gas Plant DEA Reboiler	operations	operations	operations	407085.7	3759498.7	6.1	0.25	565	2.8	Point		
1.3	Gas Plant Flare	operations	operations	operations	407085.7	3759498.7	6.1	0.25	565	2.8	Point		
Tanks	Crude Plant Tanks	operations	operations	operations	407123.8	3759198.9	12.2	-	-	-	Area		
GPFG	Gas Plant Fugitives	operations	operations	operations	407085.7	3759498.7	1	-	-	-	Area		
CFUG	Well Site - Fugitives	operations	operations	operations	406979.3	3759089.8	1	-	-	-	Area		
CDrill	Well Site - Drilling	none	drilling	5 years	406978.2	3759089.8	2	0.2	450	3.6	Point		
CDrill	Well Site - reDrilling	drilling	none	5 years	406978.2	3759089.8	2	0.2	450	3.6	Point		
Road	Catalina Road	testing drill	testing	testing averaged over 70 yrs			3						

* after the 5 years of drilling is completed

Toxic Air Contaminants Emissions

Source Code	Source	CAS	TAC Code	Pollutant	EF	EF Units	Peak Year Emissions	70 year Annual Emissions	Peak Hour Emissions	Emissions Units	Peak Year TAC Emissions, lbs	70 yr Annual TAC Emissions, lbs	Peak Hour TAC Emissions, lbs	Notes
1.1	Gas Plant Flare	71432	2	Benzene	0.0227	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	8.068	8.068	0.0388	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	50030	12	Formaldehyde	0.1670	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	59.303	59.303	0.2923	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	1151	19	PAHs, total, w/ individ. components report	0.0004	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	0.152	0.152	0.0008	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	91203	19	Naphthalene (PAH, POM)	0.0018	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	0.558	0.558	0.0028	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	75070	29	Acetaldehyde	0.0081	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	2.181	2.181	0.0118	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	107028	30	Acrolein	0.0014	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	0.507	0.507	0.0025	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	100414	40	Ethyl benzene	0.2063	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	73.254	73.254	0.3618	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	110543	44	Hexane	0.0041	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	1.471	1.471	0.0073	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	108883	68	Toluene	0.0283	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	2.942	2.942	0.0145	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.1	Gas Plant Flare	1210	70	Xylenes	0.0941	lbs TAC/lbs VOC	355	355	1.75	lbs VOC	1.471	1.471	0.0073	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	71432	2	Benzene	0.0008	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.411	0.411	4.7E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant Thermal Oxidizer	50030	12	Formaldehyde	0.0004	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.172	0.172	1.0E-04	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	91203	19	PAHs, total, w/ individ. components report	0.0005	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.007	0.007	8.1E-07	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	91203	19	Naphthalene (PAH, POM)	0.0003	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.021	0.021	2.4E-06	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	75070	29	Acetaldehyde	0.0004	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.220	0.220	2.5E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant Thermal Oxidizer	107028	30	Acrolein	0.0003	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.191	0.191	2.2E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	100414	40	Ethyl benzene	0.0010	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.489	0.489	5.6E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	110543	44	Hexane	0.0007	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	0.326	0.326	3.7E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant Thermal Oxidizer	108883	68	Toluene	0.0028	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	1.878	1.878	2.1E-04	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.2	Gas Plant DEA Reboiler	1210	70	Xylenes	0.0028	lbs TAC/lbs VOC	496	496	0.057	lbs VOC	1.396	1.396	1.6E-04	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	71432	2	Benzene	0.0008	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.092	0.092	1.1E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	50030	12	Formaldehyde	0.0018	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.199	0.199	2.2E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	1151	19	PAHs, total, w/ individ. components report	0.0005	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.002	0.002	1.9E-07	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	91203	19	Naphthalene (PAH, POM)	0.0003	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.005	0.005	5.5E-07	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	75070	29	Acetaldehyde	0.0004	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.049	0.049	5.6E-06	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	107028	30	Acrolein	0.0004	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.133	0.133	1.4E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	100414	40	Ethyl benzene	0.0010	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.110	0.109	1.3E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	110543	44	Hexane	0.0007	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.073	0.073	8.4E-06	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	108883	68	Toluene	0.0028	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.422	0.422	4.7E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
1.3	Gas Plant Thermal Oxidizer	1210	70	Xylenes	0.0028	lbs TAC/lbs VOC	111	111	0.013	lbs VOC	0.314	0.313	3.6E-05	SCAQMD 2001 using VOC EF to generate a TAC/VOC ratio
Tanks	Crude Plant Tanks	71432	2	Benzene	0.12354	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	24.077	24.077	2.7E-03	Baldwin Hills EIR factor
Tanks	Crude Plant Tanks	85638	28	1,2,4-Trimethylbenzene	0.001748	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	0.343	0.343	3.8E-05	Baldwin Hills EIR factor
Tanks	Crude Plant Tanks	100414	40	Ethyl benzene	0.009519	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	1.870	1.870	2.1E-04	Baldwin Hills EIR factor
Tanks	Crude Plant Tanks	110543	44	Hexane	0.126758	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	24.903	24.903	2.8E-03	Baldwin Hills EIR factor
Tanks	Crude Plant Tanks	108883	68	Toluene	0.06444	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	12.660	12.660	1.4E-03	Baldwin Hills EIR factor
Tanks	Crude Plant Tanks	1210	70	Xylenes	0.126970	lbs TAC/lbs VOC	196	196	0.022	lbs VOC	5.515	5.515	6.5E-04	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	71432	2	Benzene	0.000240	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.625	6.6254	7.1E-05	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	91203	19	Naphthalene (PAH, POM)	0.000003	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.008	0.0078	8.7E-07	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	75070	29	Acetaldehyde	0.000003	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.008	0.0078	8.7E-07	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	100414	40	Ethyl benzene	0.000180	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.489	5.489	5.4E-05	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	108883	68	Toluene	0.000310	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.808	8.8078	9.2E-05	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	1210	70	Xylenes	0.000003	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.008	0.0078	8.7E-07	Baldwin Hills EIR factor
GPFG	Gas Plant Fugitives	7783064	47	Hydrogen sulfide	0.000003	lbs/lbs TOC	2606	2606	0.297	lbs TOC	0.007	0.0073	8.3E-07	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	71432	2	Benzene	0.000240	lbs/lbs TOC	723	723	0.082	lbs TOC	0.173	1.734	2.0E-05	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	91203	19	Naphthalene (PAH, POM)	0.000003	lbs/lbs TOC	723	723	0.082	lbs TOC	0.002	0.0021	2.4E-07	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	75070	29	Acetaldehyde	0.000003	lbs/lbs TOC	723	723	0.082	lbs TOC	0.002	0.0021	2.4E-07	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	100414	40	Ethyl benzene	0.000180	lbs/lbs TOC	723	723	0.082	lbs TOC	0.130	1.301	1.5E-05	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	108883	68	Toluene	0.000310	lbs/lbs TOC	723	723	0.082	lbs TOC	0.224	2.240	2.6E-05	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	1210	70	Xylenes	0.000003	lbs/lbs TOC	723	723	0.082	lbs TOC	0.002	0.0021	2.4E-07	Baldwin Hills EIR factor
CFUG	Well Site - Fugitives	7783064	47	Hydrogen sulfide	0.000003	lbs/lbs TOC	723	723	0.082	lbs TOC	0.002	0.0020	2.3E-07	Baldwin Hills EIR factor
CDrill	Well Site - Drilling	9901	72	Diesel exhaust particulates	1.0246	lbs PM10	1518	108	0.000	lbs PM10	1559.710	111.12	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	1151	19	PAHs, total, w/ individ. components report	0.000003	lbs PM10	1518	108	0.000	lbs PM10	7.531	0.000	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	1210	70	Xylenes	0.0144	lbs PM10	1937	138	0.000	lbs PM10	20.163	1.44	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	107028	30	Acrolein	0.0038	lbs PM10	1937	138	0.000	lbs PM10	7.052	0.50	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	50000	12	Formaldehyde	0.1471	lbs PM10	1937	138	0.000	lbs PM10	284.94	20.36	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	67561	51	Methanol	0.0003	lbs PM10	1937	138	0.000	lbs PM10	0.581	0.002	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	71432	2	Benzene	0.0200	lbs PM10	1937	138	0.000	lbs PM10	38.757	2.77	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	75070	29	Acetaldehyde	0.0735	lbs PM10	1937	138	0.000	lbs PM10	142.420	10.17	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	75033	53	Methyl ethyl ketone (2-Butanone)	0.0003	lbs PM10	1937	138	0.000	lbs PM10	2.0	28.608	2.0	CARB Specification
CDrill	Well Site - Drilling	91203	19	Naphthalene (PAH, POM)	0.0003	lbs PM10	1937	138	0.000	lbs PM10	1.646	0.12	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	95636	26	1,2,4-Trimethylbenzene	0.0035	lbs PM10	1937	138	0.000	lbs PM10	10.266	0.73	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	100414	40	Ethyl benzene	0.0011	lbs PM10	1937	138	0.000	lbs PM10	5.928	0.42	0.0E+00	CARB Specification
CDrill	Well Site - Drilling	10425	66	Styrene	0.0006	lbs PM10	1937	138	0.000	lbs PM1				

Appendix B

Whittier Oil Field Air Emission Summary Mitigated

Construction Emissions

Activity	Peak Day Emissions (lb/day)						Total Emission (tons)									
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4	CO2	
Pad Clearing																
Construction Equipment	2.7	10.2	24.4	0.0	1.0	1.0	0.03	0.10	0.24	0.00	0.01	0.01	0.00	0.00	25	
Fugitive Dust Emissions					6.2	1.3					0.06	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	2.7	10.2	24.4	0.0	7.1	2.2	0.03	0.10	0.24	0.00	0.07	0.01	0.00	0.00	25	
Offsite Mobile Emissions	1.1	6.6	9.3	0.0	0.5	0.4	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	6	
<i>Total</i>	3.8	16.8	33.7	0.0	7.6	2.6	0.03	0.15	0.27	0.00	0.07	0.01	0.00	0.00	31	
Grading and Access Road Construction																
Combustion Equipment	6.5	37.3	74.9	0.1	3.5	3.5	0.78	4.48	8.99	0.01	0.42	0.42	0.02	0.08	1,246	
Fugitive Dust Emissions					18.6	3.9					1.12	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	6.5	37.3	74.9	0.1	22.1	7.3	0.78	4.48	8.99	0.01	1.54	0.42	0.02	0.08	1,246	
Offsite Mobile Emissions	1.3	6.5	13.1	0.0	0.6	0.6	0.07	0.35	0.79	0.00	0.04	0.03	0.00	0.01	91	
<i>Total</i>	7.8	43.9	88.0	0.1	22.7	7.9	0.85	4.84	9.78	0.01	1.57	0.45	0.02	0.08	1,337	
Facility Construction																
Combustion Equipment	8.0	20.3	44.2	0.1	2.6	2.6	0.84	2.54	5.53	0.01	0.32	0.32	0.01	0.04	578	
Fugitive Dust Emissions					10.6	2.2					0.36	0.01				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	8.0	20.3	44.2	0.1	13.2	4.8	0.84	2.54	5.53	0.01	0.68	0.33	0.01	0.04	578	
Offsite Mobile Emissions	3.6	20.2	33.3	0.0	1.6	1.4	0.25	1.74	1.59	0.00	0.08	0.07	0.02	0.04	293	
<i>Total</i>	11.6	40.5	77.6	0.1	14.8	6.2	1.08	4.27	7.12	0.01	0.76	0.39	0.03	0.08	871	
Pipeline Construction																
Combustion Equipment	4.1	19.0	30.9	0.0	1.5	1.5	0.35	1.71	2.78	0.00	0.13	0.13	0.00	0.02	339	
Fugitive Dust Emissions					2.2	0.5					0.00	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	4.1	19.0	30.9	0.0	3.7	1.9	0.35	1.71	2.78	0.00	0.14	0.13	0.00	0.02	339	
Offsite Mobile Emissions	1.5	8.3	14.9	0.0	0.7	0.6	0.14	0.83	1.18	0.00	0.06	0.05	0.01	0.02	168	
<i>Total</i>	5.6	27.3	45.8	0.1	4.4	2.6	0.48	2.54	3.96	0.01	0.19	0.18	0.01	0.04	507	
SCAQMD Regional Construction Thresholds (lbs/day)	75	550	100	150	150	55										
SCAQMD Localized Construction Thresholds (lbs/day)	-	1554	126	-	37	12										
Significant Impact Regional?	No	No	No	No	No	No										
Significant Impact Local?	No	No	No	No	No	No										

Operational Emissions

Activity	Peak Day Emissions (lb/day)						Total Emission (tons)									
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	N2O	CH4	CO2	
Drilling Emissions Testing																
Combustion Equipment and Fugitives	3.7	12.3	70.2	0.1	3.7	3.7	0.21	0.72	3.40	0.00	0.19	0.19	0.01	0.03	411	
Fugitive Dust Emissions					4.1	0.8					0.17	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	3.7	12.3	70.2	0.1	7.8	4.5	0.21	0.72	3.40	0.00	0.36	0.19	0.01	0.03	411	
Offsite Mobile Emissions	2.3	12.0	22.8	0.0	1.1	1.0	0.05	0.33	0.35	0.00	0.02	0.02	0.00	0.01	60	
<i>Total</i>	6.0	24.3	93.0	0.1	8.9	5.5	0.26	1.06	3.75	0.01	0.38	0.20	0.01	0.03	470	
Testing Emissions																
Combustion Equipment and Fugitives	10.4	12.3	45.8	0.2	2.6	2.6	0.33	0.74	2.75	0.01	0.16	0.16	0.00	0.12	2,534	
Fugitive Dust Emissions					0.5	0.1					0.03	0.00				
<i>Subtotal: Constr. Eq and Fugitive Dust</i>	10.4	12.3	45.8	0.2	3.2	2.7	0.33	0.74	2.75	0.01	0.19	0.16	0.00	0.12	2,534	
Offsite Mobile Emissions	0.7	3.7	7.9	0.0	0.4	0.3	0.04	0.22	0.48	0.00	0.02	0.02	0.00	0.00	56	
<i>Total</i>	11.1	16.0	53.7	0.2	3.5	3.0	0.38	0.96	3.22	0.01	0.21	0.18	0.01	0.13	2,590	
Operational Emissions while Drilling																
Combustion Equipment and Fugitives	46.0	210.1	780.3	3.6	45.0	44.1	1.21	2.42	4.17	0.04	0.52	0.51	0.02	1.33	8,301	
Workover Emissions	0.5	1.6	6.5	0.0	0.2	0.2	0.07	0.21	0.85	0.00	0.03	0.03	0.00	0.01	94	
Drilling Emissions	0.6	12.3	70.2	0.1	0.6	0.5	0.13	2.93	13.78	0.02	0.11	0.11	0.02	0.10	1,666	
<i>Subtotal: Stationary Eq, Workovers and Drilling</i>	47.1	224.0	857.0	3.7	45.8	44.8	1.41	5.57	18.80	0.06	0.66	0.65	0.04	1.44	10,061	
Offsite Mobile Emissions	3.4	19.7	30.1	0.0	1.5	1.3	0.3	2.5	1.9	0.0	0.1	0.1	0.0	0.1	397	
<i>Total</i>	50.5	243.7	887.1	3.7	47.2	46.1	1.75	8.06	20.73	0.07	0.76	0.73	0.06	1.50	10,458	
Operational Emissions with Re-drills only (after 5 years)																
Combustion Equipment and Fugitives	46.0	210.1	780.3	3.6	45.0	44.1	1.2	2.4	4.2	0.0	0.5	0.5	0.0	1.3	8,301	
Workover Emissions	0.5	1.6	6.5	0.0	0.2	0.2	0.1	0.2	0.8	0.0	0.0	0.0	0.0	0.0	94	
Drilling Emissions	0.6	12.3	70.2	0.1	0.6	0.5	0.0	0.4	1.7	0.0	0.0	0.0	0.0	0.0	205	
<i>Subtotal: Stationary Eq, Workovers and Drilling</i>	47.1	224.0	857.0	3.7	45.8	44.8	1.29	3.00	6.72	0.04	0.56	0.55	0.02	1.35	8,601	
Offsite Mobile Emissions	3.4	19.7	30.1	0.0	1.5	1.3	0.2	1.3	0.7	0.0	0.0	0.0	0.0	0.0	185	
<i>Total</i>	50.5	243.7	887.1	3.7	47.2	46.1	1.46	4.31	7.39	0.05	0.59	0.58	0.03	1.38	8,786	
SCAQMD Regional Operations Thresholds (lbs/day)	75	550	100	150	150	55										
SCAQMD Localized Operations Thresholds (lbs/day)	-	1554	126	-	9	3										
Significant Impact Regional?	No	No	Yes	No	No	No										
Significant Impact Local?	No	No	Yes	No	Yes	Yes										

Note: Local significance impacts compared to only stationary emissions

Appendix B

GHG Emission Summary Mitigated

Activity	N2O, tons	CH4, tons	CO2, tons	CO2e, metric tonnes
Construction, tons				
Pad Clearing Emissions	0.00	0.00	31	28
Grading and Access Road Construction Emissions	0.02	0.08	1,337	1,210
Facility Construction Emissions	0.03	0.08	871	793
Pipeline Construction Emissions	0.01	0.04	507	461
<i>Construction Total</i>				2,492
Operations - one time, tons				
Drilling Emissions - Testing	0.01	0.03	470	426
Testing Emissions	0.01	0.13	2,590	2,336
<i>Operations - one time total, tons</i>				2,762
Operations while Drilling, tons/yr				
Stationary Equipment	0.02	1.33	8,301	7,500
Workover Emissions	0.00	0.01	94	85
Drilling Emissions	0.02	0.10	1,666	1,507
Offsite Mobile Emissions	0.03	0.06	397	366
Offsite Electrical Generation	0.01	0.13	7,523	6,777
<i>Total</i>				16,235
Operations while re-Drilling, tons/yr				
Stationary Equipment	0.02	1.33	8,301	7,500
Workover Emissions	0.00	0.01	94	85
Drilling Emissions	0.00	0.01	205	186
Offsite Mobile Emissions	0.01	0.03	185	172
Offsite Electrical Generation	0.01	0.13	7,523	6,777
<i>Total</i>				14,720

Toxic Air Emissions Summary Peak and Average Year - Mitigated

Compound	CAS	Peak Year Annual Emiss, lbs	Average Year Annual Emiss, lbs
1,2,4-Trimethylbenzene	95636	2.8	1.5
Acetaldehyde	75070	36.9	19.1
Acrolein	107028	2.4	1.6
Ammonia	7664417	0.0	0.0
Arsenic and Compounds (inorganic)	7440382	0.1	0.0
Benzene	71432	42.8	38.0
Butadiene [1,3]	106990	0.9	0.4
Cadmium	7440439	0.9	0.4
Chlorine	7782505	7.9	3.1
Copper	7440508	0.6	0.2
Diesel exhaust particulates	9901	236.1	92.1
Ethyl benzene	100414	77.7	77.0
Formaldehyde	50000	129.2	93.7
Hexane	110543	27.5	27.1
Hydrogen sulfide	7783064	0.0	0.0
Lead compounds (inorganic)	7439921	1.0	0.4
Manganese	7439965	0.9	0.4
Mercury	7439976	0.7	0.3
Methanol	67561	0.1	0.1
Methyl ethyl ketone (2-Butanone)	78933	6.9	3.3
Naphthalene [PAH, POM]	91203	1.0	0.8
Nickel	7440020	0.4	0.2
PAHs, total, w/o individ. components reported [PAH, PO]	1151	2.0	1.0
Phosphorus	7723140	2.9	1.1
Propylene	115071	12.2	5.9
Selenium	7782492	0.2	0.1
Styrene	100425	0.3	0.1
Toluene	108883	25.8	22.3
Xylenes	1210	13.8	11.3
Zinc	7440666	10.1	3.9

Appendix B

Drilling and Completion Emission Calculations

for testing phase, 3 wells

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)						Total Emissions (ton)										
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	Fuel Use						
Draw works	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.28	4.28	24.38	0.03	1.28	1.27	0.06	0.19	1.10	0.00	0.06	0.06	0.00	0.01	135	16,796
Mud pump	1	2	540	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.28	4.28	24.38	0.03	1.28	1.27	0.06	0.19	1.10	0.00	0.06	0.06	0.00	0.01	135	16,796
Generator	1	2	475	0.15	0.150	0.500	2.850	0.004	0.150	0.149	0.004	0.021	350	24	2160	1.13	3.76	21.44	0.03	1.13	1.12	0.05	0.17	0.96	0.00	0.05	0.05	0.00	0.01	119	14,774
Crane	0	1	120	0.43	0.511	1.798	3.022	0.003	0.279	0.276	0.004	0.021	245	3	270	0.17	0.61	1.03	0.00	0.10	0.09	0.01	0.03	0.05	0.00	0.00	0.00	0.00	0.00	4	669
Loader	0	1	108	0.54	0.586	2.203	3.555	0.004	0.325	0.322	0.004	0.021	307	3	270	0.23	0.85	1.37	0.00	0.13	0.12	0.01	0.04	0.06	0.00	0.01	0.01	0.00	0.00	5	756
Welding Machine	0	1	45	0.45	0.45	1.121	2.879	2.635	0.003	0.267	0.265	0.004	0.021	256	6	540	0.30	0.77	0.70	0.00	0.07	0.07	0.01	0.03	0.03	0.00	0.00	0.00	0.00	3	525
Forklift	0	1	120	0.30	0.295	1.210	1.771	0.002	0.169	0.167	0.004	0.021	171	4	360	0.09	0.38	0.56	0.00	0.05	0.05	0.00	0.02	0.03	0.00	0.00	0.00	0.00	2	622	
Backhoe	0	1	108	0.55	0.504	2.170	3.198	0.004	0.230	0.228	0.004	0.021	347	4	360	0.26	1.13	1.67	0.00	0.12	0.12	0.01	0.05	0.08	0.00	0.01	0.01	0.00	0.00	8	1,026
Total															3.7	12	70	0.1	3.7	3.7	0.21	0.72	3.40	0.00	0.19	0.19	0.01	0.03	411	51,965	

- Emissions include drill rig mobilization, demobilization, drilling operations, and well completion.
- Fuel usage conversion is calculated on 0.0511 gallons per BHP-hr, as per AP-42
- Emission factors for draw works, mud pump and generator assume Tier 3 engines for Kenai 14 rig, as per Kenai Drilling data
- Emission and load factors for Crane, Forklift, Backhoe, loader, and welding machine from URBEMIS year 2011
- Totals for daily emissions are for peak day equipment only.
- Annual Drilling days 90 based on 3 wells at 30 days per well
- Not all equipment is operating each day.
- Assumes 24 hrs/day operations for drawworks, mud pump and generator
- Rig equipment load factor based on actual rig fuel use as reported by Kenai Drilling for April 1 - June 6, 2010 operations on Kenai rig 14
- Crane, loader, etc hours based on actual average hours used at Baldwin Hills Oilfield EIR
- Average fuel use per day 577 gallons
- PM2.5 to PM10 ration for diesel engines 0.991 from SCAQMD CEIDARS Tables for distillate combustion

Drilling and Completion Emission Calculations

for operational drilling phase, 30 days per well

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)						Total Emissions (ton)										
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	Fuel Use						
Draw works	1	2	540	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	8760	0.19	4.28	24.38	0.03	0.19	0.19	0.04	0.78	4.45	0.01	0.04	0.03	0.01	0.03	546	68,118
Mud pump	1	2	540	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	8760	0.19	4.28	24.38	0.03	0.19	0.19	0.04	0.78	4.45	0.01	0.04	0.03	0.01	0.03	546	68,118
Generator	1	2	475	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	8760	0.17	3.76	21.44	0.03	0.17	0.17	0.03	0.69	3.91	0.01	0.03	0.03	0.01	0.03	481	59,918
Crane	0	1	120	0.43	0.077	1.798	3.022	0.003	0.042	0.041	0.004	0.021	245	3	1095	0.03	0.61	1.03	0.00	0.01	0.01	0.00	0.11	0.19	0.00	0.00	0.00	0.00	15	2,712	
Loader	0	1	108	0.54	0.088	2.203	3.555	0.004	0.049	0.048	0.004	0.021	307	3	1095	0.03	0.85	1.37	0.00	0.02	0.02	0.01	0.15	0.25	0.00	0.00	0.00	0.00	22	3,065	
Welding Machine	0	1	45	0.45	0.168	2.879	2.635	0.003	0.040	0.040	0.004	0.021	256	6	2190	0.04	0.77	0.70	0.00	0.01	0.01	0.01	0.14	0.13	0.00	0.00	0.00	0.00	12	2,129	
Forklift	0	1	120	0.30	0.044	1.210	1.771	0.002	0.025	0.025	0.004	0.021	171	4	1460	0.01	0.38	0.56	0.00	0.01	0.01	0.00	0.07	0.10	0.00	0.00	0.00	0.00	10	2,523	
Backhoe	0	1	108	0.55	0.076	2.170	3.198	0.004	0.035	0.034	0.004	0.021	347	4	1460	0.04	1.13	1.67	0.00	0.02	0.02	0.01	0.21	0.31	0.00	0.00	0.00	0.00	33	4,163	
Total															0.6	12	70	0.1	0.6	0.5	0.13	2.93	13.78	0.02	0.11	0.11	0.02	0.10	1666	210,746	

- Annual Drilling days 365 based on continuous drilling at 30 days per well
- DPM mitigation 0.85 factor reduction in PM & VOC

Re-Drilling Emission Calculations

for operational re-drilling phase, 15 days per well

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)						Total Emissions (ton)									
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	Fuel Use					
Draw works	1	2	540	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	1080	0.19	4.28	24.38	0.03	0.19	0.19	0.00	0.10	0.55	0.00	0.00	0.00	0.00	67	8,398
Mud pump	1	2	540	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	1080	0.19	4.28	24.38	0.03	0.19	0.19	0.00	0.10	0.55	0.00	0.00	0.00	0.00	67	8,398
Generator	1	2	475	0.15	0.023	0.500	2.850	0.004	0.023	0.022	0.004	0.021	350	24	1080	0.17	3.76	21.44	0.03	0.17	0.17	0.00	0.08	0.48	0.00	0.00	0.00	0.00	59	7,387
Crane	0	1	120	0.43	0.077	1.798	3.022	0.003	0.042	0.041	0.004	0.021	245	3	135	0.03	0.61	1.03	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00	2	334
Loader	0	1	108	0.54	0.088	2.203	3.555	0.004	0.049	0.048	0.004	0.021	307	3	135	0.03	0.85	1.37	0.00	0.02	0.02	0.00	0.02	0.03	0.00	0.00	0.00	0.00	3	378
Welding Machine	0	1	45	0.45	0.168	2.879	2.635	0.003	0.040	0.040	0.004	0.021	256	6	270	0.04	0.77	0.70	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	2	262
Forklift	0	1	120	0.30	0.044	1.210	1.771	0.002	0.025	0.025	0.004	0.021	171	4	180	0.01	0.38	0.56	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	1	311
Backhoe	0	1	108	0.55	0.076	2.170	3.198	0.004	0.035	0.034	0.004	0.021	347	4	180	0.04	1.13	1.67	0.00	0.02	0.02	0.00	0.03	0.04	0.00	0.00	0.00	0.00	4	513
Total															0.6	12	70	0.1	0.6	0.5	0.02	0.36	1.70	0.00	0.01	0.01	0.00	0.01	205	25,982

- Annual re-Drilling days 45 assumes 3 redrill per year and 15 days per redrill
- DPM mitigation 0.85 factor reduction in PM & VOC

Workover Emission Calculations

for operational phase, 52 production wells

Equipment	Include in Peak Day?	Number	BHP	Load	Emission Factors (g/bhp-hr)								Hrs/ day	Total Annual Hours	Emissions (lb/day)						Total Emissions (ton)									
					VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄			CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂	Fuel Use					
Generator	1	1	200	0.25	0.290	0.925	3.796	0.005	0.109	0.108	0.004	0.021	421	12	3120	0.38	1.22	5.01	0.01	0.14	0.14	0.05	0.16	0.65	0.00	0.02	0.02	0.00	72	7,488
Off highway truck	1	1	200	0.10	0.302	0.798	2.876	0.004	0.100	0.099	0.004	0.021	324	12	3120	0.16	0.42	1.52	0.00	0.05	0.05	0.02	0.05	0.20	0.00	0.01	0.01	0.00	22	2,995
Total															0.5	1.6	6.5	0.0	0.2	0.2	0.07	0.21	0.85	0.00	0.03	0.03	0.00	0.01	94	10,483

- Annual workover days 260 based on one service per production well each year for 5 days, as per applicant submittal

Appendix B

Offsite Mobile Emissions

Source	Vehicle Type	Emission Factors (lbs/mile)								Peak Trips per day	Average Trips per day	Length of Trip (miles)	Peak Day Emissions, lbs/day					Total Emissions, Tons/yr										
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄				CO ₂	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	N ₂ O	CH ₄	CO ₂
Well Area Clearing																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	12	11	27	0.32	3.09	0.32	0.00	0.03	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.00	4	
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	8	1.4	27	0.70	2.73	8.90	0.01	0.42	0.37	0.00	0.01	0.02	0.00	0.00	0.00	0.00	2	
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
Total Well Pad Clearing														1.10	6.59	9.31	0.01	0.46	0.39	0.01	0.04	0.02	0.00	0.00	0.00	0.00	6	
Well Drilling Test																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.01	25	
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.03	0.10	0.33	0.00	0.02	0.01	0.00	33	
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1	
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.05	0.33	0.35	0.00	0.02	0.02	0.00	0.01	60
Testing																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	4	4	27	0.11	1.03	0.11	0.00	0.01	0.01	0.01	0.06	0.01	0.00	0.00	0.00	0.00	7	
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	7	7	27	0.61	2.39	7.79	0.01	0.37	0.33	0.04	0.14	0.47	0.00	0.02	0.02	0.00	47	
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	1	1	27	0.03	0.26	0.03	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2	
Total Testing														0.75	3.68	7.93	0.01	0.38	0.33	0.04	0.22	0.48	0.00	0.02	0.02	0.00	0.00	56
Facility Grading																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	9	6.5	27	0.24	2.32	0.24	0.00	0.02	0.01	0.01	0.10	0.01	0.00	0.00	0.00	0.00	11	
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	1	1.1	27	0.09	0.34	1.11	0.00	0.05	0.05	0.01	0.02	0.07	0.00	0.00	0.00	0.00	7	
Trucks - Soil Hauling	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	78	77.6	27	3.6	0.92	3.60	11.75	0.01	0.56	0.49	0.06	0.21	0.70	0.00	0.03	0.00	71	
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	1	1	27	0.03	0.26	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	2	
Total Facility Grading														1.28	6.52	13.13	0.02	0.64	0.55	0.07	0.35	0.79	0.00	0.04	0.03	0.00	0.01	91
Facility Construction																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	37	39	27	0.98	9.53	0.99	0.01	0.08	0.05	0.13	1.26	0.13	0.00	0.01	0.01	0.01	0.03	142
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	29	10.5	27	2.54	9.89	32.28	0.03	1.54	1.35	0.11	0.45	1.46	0.00	0.07	0.06	0.00	0.01	147
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	4	
Total Facility Construction														3.60	20.20	33.35	0.04	1.63	1.41	0.25	1.74	1.59	0.00	0.08	0.07	0.02	0.04	293
Pipeline Construction																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	12	14	27	0.32	3.09	0.32	0.00	0.03	0.02	0.05	0.45	0.05	0.00	0.00	0.00	0.01	0.01	51
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	13	8.1	27	1.14	4.43	14.47	0.01	0.69	0.61	0.09	0.35	1.13	0.00	0.05	0.05	0.00	0.00	113
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	4	
Total Facility Construction														1.53	8.30	14.87	0.02	0.72	0.63	0.14	0.83	1.18	0.00	0.06	0.05	0.01	0.02	168
Operations																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	20	20.9	27	0.53	5.15	0.53	0.01	0.05	0.03	0.10	0.98	0.10	0.00	0.01	0.01	0.01	0.03	111
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	6	1.9	27	0.53	2.05	6.68	0.01	0.32	0.28	0.03	0.12	0.39	0.00	0.02	0.02	0.00	0.00	39
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	2	1	27	0.05	0.52	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	5
Total Operations														1.11	7.71	7.27	0.01	0.37	0.31	0.14	1.15	0.49	0.00	0.03	0.02	0.01	0.03	156
Well Drilling Operations																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.09	0.89	0.09	0.00	0.01	0.00	0.01	0.02	101
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.11	0.41	1.34	0.00	0.06	0.06	0.00	0.01	135
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	5	
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.20	1.35	1.44	0.00	0.07	0.06	0.01	0.03	241
Well Drilling Operations Re-drills																												
Workers Commuting	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	17	19	27	0.45	4.38	0.45	0.00	0.04	0.02	0.01	0.11	0.01	0.00	0.00	0.00	0.00	12	
Trucks	HDDT - Diesel	0.00329	0.01282	0.04185	0.00004	0.00200	0.00175	0.00011	0.00018	4.2	20	6.6	27	1.75	6.82	22.26	0.02	1.06	0.93	0.01	0.05	0.17	0.00	0.01	0.01	0.00	0.00	17
Visitors	LDA - Gasoline	0.00099	0.00969	0.00101	0.00001	0.00009	0.00005	0.00011	0.00025	1.1	3	1	27	0.08	0.77	0.08	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1	
Total Well Drilling Test														2.28	11.97	22.80	0.03	1.11	0.96	0.02	0.17	0.18	0.00	0.01	0.01	0.00	0.00	30

- Emission Factors from SCAQMD Highest (Most Conservative) EMFAC 2007 emission factors for on-road vehicles.
- Length of trip is assumed to be round trip distances, based on URBEMIS default values for LA County, commercial urban commute
- Well pad clearing days 25
- Well drilling test days 90
- Testing days 120
- Well pad grading/access rd days 120
- Facility construction days 250 for a 50 week year
- Pipeline construction days 180
- Re-drills, annual days 45
- Operations assumes 365 days per year
- CH₄ emission factors from USEPA for running operations. Climate Leader Greenhouse Gas Inventory Protocol, Core Module Guidance, Direct Emissions from Mobile Combustion Sources, October 2004.
- Mitigation is to reduce distance to 1.8 miles to savage canyon landfill for soil hauling, or reduce to EPA 2010 equivalent of 0.2 g/bhp-hr (about 0.0015 lb/mile) Nox

Appendix B

Pad Clearing Fugitive Dust Emission Calculations - Mitigated

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.16	acre/day	20	10.296	lbs/acre	1.63	0.34	32.64	3.49
Fill dumping	411	tons/day	20	0.003	lbs/ton	1.16	0.24	23.12	0.00
Travel on dirt roads, trucks	3.79	vehicle-miles	20	0.32	lbs/vehicle-miles	1.22	0.25	24.35	0.08
Travel on dirt roads, passenger vehicle	7.10	vehicle-miles	20	0.07	lbs/vehicle-miles	0.47	0.10	9.36	0.01
Disturbed area	0.16	acre/day	20	10.296	lbs/acre	1.63	0.34	32.64	3.49
Fill Storage Piles	0.10	acres	10	0.70	lbs/day/acre	0.07	0.01	0.70	0.01
Total						6.18	1.28	123	7.09

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	8	Peak day of 8 vehicles, as per PD
average number of vehicles per day, passenger vehicles	15	Peak day of 15 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total well area of project site
Total days of grading	20	5 days per week for 4 weeks
Total days of disturbed area	20	5 days per week for 4 weeks
Total cut and fill, yr ³	21,100	10% of total cut and fill for areas, 10% of for site clearing
Mitigation: grading/dist area watering (fraction reduction)	0.61	every 3 hours
Mitigation: dumping soil moisture (fraction reduction)	0.69	minimum 12% soil moisture
Mitigation: storage piles (fraction reduction)	0.90	water by hand and cover
Mitigation: roads (fraction reduction)	0.00	

Test Drilling Fugitive Dust Emission Calculations - Mitigated

test drilling would be performed with the roads and pads still dirt and would therefore create fugitive dust emissions

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	10.296	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	0.00	tons/day	0	0.003	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	9.47	vehicle-miles	84	0.32	lbs/vehicle-miles	3.04	0.63	255.63	0.20
Travel on dirt roads, passenger vehicle	9.47	vehicle-miles	84	0.07	lbs/vehicle-miles	0.62	0.13	52.40	0.01
Disturbed area	0.04	acre/day	84	10.296	lbs/acre	0.39	0.08	32.64	0.83
Fill Storage Piles	0.00	acres	10	0.70	lbs/day/acre	0.00	0.00	0.00	0.00
Total						4.06	0.84	341	1.04

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	20	Peak day of 20 vehicles, as per PD
average number of vehicles per day, passenger vehicles	20	Peak day of 20 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total well area of project site
Total days of grading	0	no grading
Total days of disturbed area	84	3 months of drilling, every day
Total cut and fill, yr ³	0	no cut and fill during this stage
Mitigation: grading/dist area watering (fraction reduction)	0.61	every 3 hours
Mitigation: dumping soil moisture (fraction reduction)	0.69	minimum 12% soil moisture
Mitigation: storage piles (fraction reduction)	0.90	water by hand and cover
Mitigation: roads (fraction reduction)	0.00	

Appendix B

Testing Fugitive Dust Emission Calculations - Mitigated

testing would be performed with the roads and pads still dirt and would therefore create fugitive dust emissions

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	10.296	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	0.00	tons/day	0	0.003	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	3.31	vehicle-miles	120	0.06	lbs/vehicle-miles	0.21	0.04	25.56	0.00
Travel on dirt roads, passenger vehicle	2.37	vehicle-miles	120	0.01	lbs/vehicle-miles	0.03	0.01	3.74	0.00
Disturbed area	0.03	acre/day	120	10.296	lbs/acre	0.27	0.06	32.64	0.58
Fill Storage Piles	0.00	acres	10	0.70	lbs/day/acre	0.00	0.00	0.00	0.00
Total						0.52	0.11	62	0.59

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on

following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	7	Peak day of 7 vehicles, as per PD
average number of vehicles per day, passenger vehicles	5	Peak day of 5 vehicles, as per PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	3.17	equal to total well area of project site
Total days of grading	0	no grading
Total days of disturbed area	120	4 months testing
Total cut and fill, yr ³	0	no cut and fill for this stage
Mitigation: grading/dist area watering (fraction reduction)	0.61	every 3 hours
Mitigation: dumping soil moisture (fraction reduction)	0.69	minimum 12% soil moisture
Mitigation: storage piles (fraction reduction)	0.90	water by hand and cover
Mitigation: roads (fraction reduction)	0.80	dust suppressants

Grading Fugitive Dust Emission Calculations - Mitigated

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.17	acre/day	120	10.296	lbs/acre	1.71	0.36	205.30	3.66
Fill dumping	4,108	tons/day	120	0.003	lbs/ton	11.56	2.40	1,386.96	0.01
Travel on dirt roads, trucks	9.47	vehicle-miles	120	0.32	lbs/vehicle-miles	3.04	0.63	365.18	0.20
Travel on dirt roads, passenger vehicle	3.55	vehicle-miles	120	0.07	lbs/vehicle-miles	0.23	0.05	28.07	0.00
Disturbed area	0.17	acre/day	120	10.296	lbs/acre	1.71	0.36	205.30	3.66
Fill Storage Piles	0.50	acres	120	0.70	lbs/day/acre	0.35	0.07	42.25	0.05
Total						18.61	3.87	2,233	7.59

Notes for the Table

Emission factors taken from SCAQMD CEQA Guidance document

Emission factor for travel on unpaved roads based on

following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	20	peak day pad grading, in PD
average number of vehicles per day, passenger vehicles	7.5	peak day pad grading, in PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500')
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	19.94	total sum of pad areas disturbed + temp construction parking and staging + half of access road
Total days of grading	120	5 days per week for 6 month
Total days of disturbed area	120	5 days per week for 6 month
Total cut and fill, yr ³	211,000	total cut and fill sum for all pads and processing area and access road
Mitigation: grading/dist area watering (fraction reduction)	0.61	every 3 hours
Mitigation: dumping soil moisture (fraction reduction)	0.69	minimum 12% soil moisture
Mitigation: storage piles (fraction reduction)	0.90	water by hand and cover
Mitigation: roads (fraction reduction)	0.00	

Appendix B

Facilities Construction Fugitive Dust Emission Calculations - Mitigated

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.24	acre/day	68	10.296	lbs/acre	2.47	0.51	167.82	5.29
Fill dumping	0	tons/day	68	0.003	lbs/ton	0.00	0.00	0.00	0.00
Travel on dirt roads, trucks	13.73	vehicle-miles	68	0.32	lbs/vehicle-miles	4.41	0.92	300	0.29
Travel on dirt roads, passenger vehicle	18.94	vehicle-miles	68	0.07	lbs/vehicle-miles	1.25	0.26	84.84	0.02
Disturbed area	0.24	acre/day	68	10.296	lbs/acre	2.47	0.51	167.82	5.29
Fill Storage Piles	0.00	acres	10	0.70	lbs/day/acre	0.00	0.00	0.00	0.00
Total						10.60	2.20	721	10.88

Notes for the Table

Emission factors taken from SCAQMD CEQA document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	1	Most of Catalina is paved. Assume low silt content
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	29	peak day facility construction, in PD
average number of vehicles per day, passenger vehicles	40	peak day facility construction, in PD
distance of travel for each vehicle on site, ft	2500	Average distance from Catalina gate to Project Site (2500)
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	16.30	total sum of pad areas disturbed + temp construction parking and staging+access road
Total days of grading	68	68 days for foundation completion, assumed dirt areas during this time
Total days of disturbed area	68	68 days for foundation completion, assumed dirt areas during this time
Total cut and fill, yr ³	0	All cut and fill conducted in grading stage
Mitigation: grading/dist area watering (fraction reduction)	0.61	every 3 hours
Mitigation: dumping soil moisture (fraction reduction)	0.69	minimum 12% soil moisture
Mitigation: storage piles (fraction reduction)	0.90	water by hand and cover
Mitigation: roads (fraction reduction)	0.00	

Pipeline Construction Fugitive Dust Emission Calculations

Activity	Source	Source Units	Number of Days	Emission Factor	Emission Factor, Units	Daily Emissions (lbs/day)		Total Emissions (lbs/yr)	
						PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Site grading	0.00	acre/day	0	26.4	lbs/acre	0.00	0.00	0.00	0.00
Fill dumping	169	tons/day	0	0.009	lbs/ton	1.53	0.32	0.00	0.00
Travel on dirt roads, trucks	0.00	vehicle-miles	180	7.71	lbs/vehicle-miles	0.00	0.00	0	0.00
Travel on dirt roads, passenger vehicle	0.00	vehicle-miles	0	1.58	lbs/vehicle-miles	0.00	0.00	0.00	0.00
Disturbed area	0.00	acre/day	180	26.4	lbs/acre	0.00	0.00	0.37	0.01
Fill Storage Piles	0.10	acres	10	7.04	lbs/day/acre	0.70	0.15	7.04	1.03
Total						2.24	0.47	7	1.05

Notes for the Table

Emission factors taken from SCAQMD CEQA document

Emission factor for travel on unpaved roads based on following inputs

surface silt loading in percent	24	
mean vehicle speed in mph	15	
mean vehicle weight in ton, trucks	10	
mean vehicle weight in ton, passenger vehicles	2	
mean number of wheels on vehicle, trucks	10	
mean number of wheels on vehicle, passenger vehicles	4	
mean number of rain days per year	0	
average number of vehicles per day, trucks	13	peak day pipeline construction, in PD
average number of vehicles per day, passenger vehicles	15	peak day pipeline construction, in PD
distance of travel for each vehicle on site, ft	0	no distance on dirt roads
Soil, tons/yr ³	1.01	
Silt content of soil	1.5	
Total disturbed area (acres)	0.01	pipeline ROW 3' by an estimated 200' per day
Total days of grading	0	days for pipeline installation, as per PD
Total days of disturbed area	180	days for pipeline installation, as per PD
Total cut and fill, yr ³	8,683	based on length of pipelines and trench width and depth
Mitigation: grading/dist area watering (fraction reduction)	0.00	
Mitigation: dumping soil moisture (fraction reduction)	0.00	
Mitigation: storage piles (fraction reduction)	0.00	
Mitigation: roads (fraction reduction)	0.00	

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification: TK101
 City: Whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: wash tanks

Tank Dimensions

Diameter (ft): 40.00
 Volume (gallons): 225,456.00
 Turnovers: 679.96
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System

Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics

Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status

Quantity

Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	12
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK101 - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK101 - Internal Floating Roof Tank
Whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdraw Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	78.01	3,665.68	198.68	0.00	3,942.36

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification: TK102P
 City: Whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: Primary shipping tank

Tank Dimensions

Diameter (ft): 50.00
 Volume (gallons): 469,728.00
 Turnovers: 326.36
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System

Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics

Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status

Quantity

Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	15
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK102P - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK102P - Internal Floating Roof Tank
Whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	97.51	2,932.54	227.56	0.00	3,257.62

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification
 User Identification: TK102S
 City: Whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: Secondary Shipping Tank

Tank Dimensions
 Diameter (ft): 26.00
 Volume (gallons): 67,200.00
 Turnovers: 2,281.25
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics
 Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System
 Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics
 Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	9
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK102S - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK102S - Internal Floating Roof Tank
Whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	50.71	5,639.50	169.79	0.00	5,860.00

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification
 User Identification: TK103
 City: Whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: Reject tank

Tank Dimensions
 Diameter (ft): 30.00
 Volume (gallons): 101,472.00
 Turnovers: 1,510.76
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics
 Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System
 Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics
 Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	10
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK103 - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK103 - Internal Floating Roof Tank
Whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	58.51	4,887.57	179.42	0.00	5,125.49

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification
 User Identification: TK-104
 City: Whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: Clarifier

Tank Dimensions
 Diameter (ft): 20.00
 Volume (gallons): 45,108.00
 Turnovers: 2,446.93
 Self Supp. Roof? (y/n): N
 No. of Columns: 1.00
 Eff. Col. Diam. (ft): 1.00

Paint Characteristics
 Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System
 Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics
 Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam./Unbolted Cover, Ungasketed)	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Column Well (24-in. Diam./Built-Up Col.-Sliding Cover, Ungask.	1
Ladder Well (36-in. Diam./Sliding Cover, Ungasketed)	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam./Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam./Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK-104 - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK-104 - Internal Floating Roof Tank
Whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	39.00	5,542.50	310.08	0.00	5,891.59

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification
 User Identification: TK105
 City: whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: filtered water

Tank Dimensions
 Diameter (ft): 42.00
 Volume (gallons): 331,461.00
 Turnovers: 333.00
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics
 Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System
 Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics
 Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	13
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK105 - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK105 - Internal Floating Roof Tank
whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	81.91	2,513.61	208.31	0.00	2,803.82

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification: TK106
 City: whittier
 State: California
 Company: Matrix
 Type of Tank: Internal Floating Roof Tank
 Description: skim drain tank

Tank Dimensions

Diameter (ft): 30.00
 Volume (gallons): 101,472.00
 Turnovers: 1,087.75
 Self Supp. Roof? (y/n): Y
 No. of Columns: 0.00
 Eff. Col. Diam. (ft): 0.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Rim-Seal System

Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Characteristics

Deck Fitting Category: Typical
 Deck Type: Welded

Deck Fitting/Status

Quantity

Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	10
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meteorological Data used in Emissions Calculations: Los Angeles AP, California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

TK106 - Internal Floating Roof Tank
Whittier, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude oil (RVP 5)	All	65.10	60.53	69.67	62.97	3.1780	N/A	N/A	50.0000			207.00	Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

TK106 - Internal Floating Roof Tank
whittier, California

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude oil (RVP 5)	58.51	3,519.05	179.42	0.00	3,756.97

TANKS 4.0.9d
Emissions Report - Summary Format
Total Emissions Summaries - All Tanks in Report

Emissions Report for: Annual

Tank Identification				Losses (lbs)
TK101	Matrix	Internal Floating Roof Tank	Whittier, California	3,942.36
TK102P	Matrix	Internal Floating Roof Tank	Whittier, California	3,257.62
TK102S	Matrix	Internal Floating Roof Tank	Whittier, California	5,860.00
TK103	Matrix	Internal Floating Roof Tank	Whittier, California	5,125.49
TK-104	Matrix	Internal Floating Roof Tank	Whittier, California	5,891.59
TK105	Matrix	Internal Floating Roof Tank	whittier, California	2,803.82
TK106	Matrix	Internal Floating Roof Tank	whittier, California	3,756.97
Total Emissions for all Tanks:				30,637.85

Appendix B

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** BREEZE AERMOD
** Trinity Consultants
** VERSION 7.2

CO STARTING
CO TITLEONE Penn Street Emissions, unit, 1 g/m2-s, DPM Annual
CO MODELOPT DFAULT CONC
CO RUNORNOT RUN
CO AVERTIME ANNUAL
CO POLLUTID OTHER
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION 16FO2000 AREA 404680.139060204 3759685.968778990 93.68
SO LOCATION 16FO2001 AREA 404730.135142773 3759685.198941670 97.85
SO LOCATION 16FO2002 AREA 404780.131225342 3759684.419106460 99.67
SO LOCATION 16FO2003 AREA 404830.119061814 3759683.649269140 101.41
SO LOCATION 16FO2004 AREA 404880.115144383 3759682.879431820 103.25
SO LOCATION 16FO2005 AREA 404930.111226952 3759682.099596610 106.60
SO LOCATION 16FO2006 AREA 404980.107309521 3759681.329759290 110.01
SO LOCATION 16FO2007 AREA 405030.095145993 3759680.549924080 115.69
SO LOCATION 16FO2008 AREA 405080.091228562 3759679.780086760 121.11
SO LOCATION 16FO2009 AREA 405130.087311131 3759679.000251550 126.15
SO LOCATION 16FO200A AREA 405180.083393700 3759678.230414230 129.22
SO LOCATION 16FO200B AREA 405230.071230172 3759677.450579020 129.44
SO LOCATION 16FO200C AREA 405280.067312741 3759676.680741700 129.44
SO LOCATION 16FO200D AREA 405330.063395310 3759675.910904380 125.06
SO LOCATION 16FO200E AREA 405380.199661518 3759674.781143110 121.15
SO LOCATION 16FO200F AREA 405430.269958955 3759667.302723420 120.00
SO LOCATION 16FO200G AREA 405478.773498072 3759658.874504440 121.03
SO LOCATION 16FO200H AREA 405526.402950970 3759663.993422730 122.75
SO LOCATION 16FO200I AREA 405566.503717840 3759689.238088130 124.63
SO LOCATION 16FO200J AREA 405604.683144245 3759721.521266180 127.63
SO LOCATION 16FO200K AREA 405642.862570650 3759753.794446350 132.33
SO LOCATION 16FO200L AREA 405677.141593450 3759788.717066650 143.52
SO LOCATION 16FO200M AREA 405708.468513734 3759827.688831290 151.55
SO LOCATION 16FO200N AREA 405739.803680114 3759866.650598060 151.62
SO SRCPARAM 16FO2000 1 3 50 10 1 0
SO SRCPARAM 16FO2001 1 3 50 10 1 0
SO SRCPARAM 16FO2002 1 3 50 10 1 0
SO SRCPARAM 16FO2003 1 3 50 10 1 0
SO SRCPARAM 16FO2004 1 3 50 10 1 0
SO SRCPARAM 16FO2005 1 3 50 10 1 0
SO SRCPARAM 16FO2006 1 3 50 10 1 0
SO SRCPARAM 16FO2007 1 3 50 10 1 0
SO SRCPARAM 16FO2008 1 3 50 10 1 0
SO SRCPARAM 16FO2009 1 3 50 10 1 0
SO SRCPARAM 16FO200A 1 3 50 10 1 0
SO SRCPARAM 16FO200B 1 3 50 10 1 0
SO SRCPARAM 16FO200C 1 3 50 10 1 0
SO SRCPARAM 16FO200D 1 3 50 10 1 0
SO SRCPARAM 16FO200E 1 3 50 10 8 0
SO SRCPARAM 16FO200F 1 3 50 10 10 0
SO SRCPARAM 16FO200G 1 3 50 10 -6 0
SO SRCPARAM 16FO200H 1 3 50 10 -32 0
SO SRCPARAM 16FO200I 1 3 50 10 -40 0
SO SRCPARAM 16FO200J 1 3 50 10 -40 0
SO SRCPARAM 16FO200K 1 3 50 10 -46 0
SO SRCPARAM 16FO200L 1 3 50 10 -51 0
SO SRCPARAM 16FO200M 1 3 50 10 -51 0
SO SRCPARAM 16FO200N 1 3 50 10 -51 0
SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE ELEVUNIT METERS
** BOUNDARY 16FO201C
RE DISCCART 404690.9 3759703 95.26 389
RE DISCCART 405108.9 3759696.2 125.38 389
RE DISCCART 405273.6 3759694.8 130.16 414
RE DISCCART 405272.7 3759668.3 129.37 404
RE DISCCART 404690.4 3759678.3 94.36 389
** BOUNDARY 16FO201N
RE DISCCART 405273.2 3759694.8 130.18 414
RE DISCCART 405361 3759693.4 123.05 414
RE DISCCART 405397.1 3759688.4 120.72 414
RE DISCCART 405442.9 3759683.8 120 414
RE DISCCART 405486.8 3759677 120.53 414
RE DISCCART 405524.7 3759682.5 121.11 414
RE DISCCART 405560.9 3759707.6 124.32 414
RE DISCCART 405597.5 3759739.2 125.07 414
RE DISCCART 405630.4 3759768.9 130.97 414
RE DISCCART 405674.8 3759831.6 150.47 414
RE DISCCART 405707.2 3759805.5 149.47 414
RE DISCCART 405688.5 3759690.2 151.48 414
RE DISCCART 405633.6 3759688.9 136.02 414
RE DISCCART 405615.3 3759664.2 136.85 414
RE DISCCART 405571.4 3759680.6 126.5 414
RE DISCCART 405541.2 3759657.3 124.56 414
RE DISCCART 405479.9 3759647.2 121.85 414
RE DISCCART 405419.5 3759654.1 120 414
RE DISCCART 405366 3759663.7 121.72 414
RE DISCCART 405325.3 3759670.6 125.18 414
RE DISCCART 405273.6 3759668.3 129.31 414
RE FINISHED

ME STARTING
ME SURFFILE "I:\Whittier\Report\Air\Penn Modeling\pico.SFC"
** SURFFILE "I:\Whittier\Report\Air\Penn Modeling\pico.SFC"
ME PROFFILE "I:\Whittier\Report\Air\Penn Modeling\pico.PFL"
** PROFFILE "I:\Whittier\Report\Air\Penn Modeling\pico.PFL"
ME SURFDATA 0 2005 PICORIVERA

```

Appendix B

ME UAIRDATA 3190 2005
 ME PROFBASE 58
 ME FINISHED

OU STARTING
 OU FILEFORM FIX
 OU PLOTFILE ANNUAL ALL ALL`ANNUAL.plt 10000
 OU FINISHED

*** Message Summary For AERMOD Model Setup ***

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)
 A Total of 1 Warning Message(s)
 A Total of 0 Informational Message(s)

***** FATAL ERROR MESSAGES *****
 *** NONE ***

***** WARNING MESSAGES *****
 OU W565 110 PERPLT:Possible Conflict With Dynamically Allocated FUNIT PLOTFILE

 *** SETUP Finishes Successfully ***

• *** AERMOD - VERSION 09292 *** *** NO TITLE SPECIFIED *** 01/31/11
 *** *** *** 16:46:32
 *** *** *** PAGE 1

**MODELOPTs: RegDEFAULT CONC ELEV

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION. DRYDPLT = F
 **Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
 1. Stack-tip Downwash.
 2. Model Accounts for ELEVated Terrain Effects.
 3. Use Calms Processing Routine.
 4. Use Missing Data Processing Routine.
 5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes: 24 Source(s); 1 Source Group(s); and 26 Receptor(s)

**The Model Assumes A Pollutant Type of: OTHER

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
 Model Outputs Tables of ANNUAL Averages by Receptor
 Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
 m for Missing Hours
 b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 58.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
 Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
 Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.5 MB of RAM.

• *** AERMOD - VERSION 09292 *** *** NO TITLE SPECIFIED *** 01/31/11
 *** *** *** 16:46:32
 *** *** *** PAGE 2

**MODELOPTs: RegDEFAULT CONC ELEV

*** AREA SOURCE DATA ***

RATE	NUMBER	EMISSION RATE	COORD (SW CORNER)		BASE	RELEASE	X-DIM	Y-DIM	ORIENT.	INIT.	URBAN	EMISSION	
VARY	SOURCE	PART.	(GRAMS/SEC	X	Y	ELEV.	HEIGHT	OF AREA	OF AREA	OF AREA	SZ	SOURCE	SCALAR
	ID	CATS.	/METER**2)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(DEG.)	(METERS)		BY
	16FO2000	0	0.10000E+01	404680.1	3759686.0	93.7	3.00	50.00	10.00	1.00	0.00	NO	
	16FO2001	0	0.10000E+01	404730.1	3759685.2	97.8	3.00	50.00	10.00	1.00	0.00	NO	
	16FO2002	0	0.10000E+01	404780.1	3759684.4	99.7	3.00	50.00	10.00	1.00	0.00	NO	
	16FO2003	0	0.10000E+01	404830.1	3759683.6	101.4	3.00	50.00	10.00	1.00	0.00	NO	
	16FO2004	0	0.10000E+01	404880.1	3759682.9	103.2	3.00	50.00	10.00	1.00	0.00	NO	
	16FO2005	0	0.10000E+01	404930.1	3759682.1	106.6	3.00	50.00	10.00	1.00	0.00	NO	

Appendix B

Table with columns for receptor ID, coordinates, and elevation. Includes a summary row: *** AERMOD - VERSION 09292 *** NO TITLE SPECIFIED

**MODELOPTs: RegDFAULT CONC ELEV

*** SOURCE IDs DEFINING SOURCE GROUPS ***

Table with columns for GROUP ID and SOURCE IDs. Lists various receptor IDs like 16FO2000, 16FO2001, etc.

*** AERMOD - VERSION 09292 *** NO TITLE SPECIFIED

**MODELOPTs: RegDFAULT CONC ELEV

*** DISCRETE CARTESIAN RECEPTORS *** (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG) (METERS)

Table listing discrete Cartesian receptors with columns for X, Y, Z, ZHILL, and ZFLAG coordinates.

*** AERMOD - VERSION 09292 *** NO TITLE SPECIFIED

**MODELOPTs: RegDFAULT CONC ELEV

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING *** (1=YES; 0=NO)

Table of meteorological day selection flags (1 for YES, 0 for NO) for various receptors.

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES *** (METERS/SEC)

*** AERMOD - VERSION 09292 *** NO TITLE SPECIFIED

**MODELOPTs: RegDFAULT CONC ELEV

Appendix B

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: I:\Whittier\Report\Air\Penn Modeling\pico.SFC Met Version: 06341
 Profile file: I:\Whittier\Report\Air\Penn Modeling\pico.PFL
 Surface format: FREE
 Profile format: FREE
 Surface station no.: 0 Upper air station no.: 3190
 Name: PICORIVERA Name: UNKNOWN
 Year: 2005 Year: 2005

First 24 hours of scalar data																			
YR	MO	DY	JDY HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
05	10	12	285 01	-0.5	0.026	-9.000	-9.000	-999.	9.	2.8	0.40	1.00	1.00	0.40	44.	9.1	285.8	5.5	
05	10	12	285 02	-0.5	0.026	-9.000	-9.000	-999.	9.	2.8	0.40	1.00	1.00	0.40	16.	9.1	285.4	5.5	
05	10	12	285 03	-0.3	0.019	-9.000	-9.000	-999.	6.	2.1	0.40	1.00	1.00	0.30	32.	9.1	284.9	5.5	
05	10	12	285 04	-0.7	0.032	-9.000	-9.000	-999.	13.	4.2	0.40	1.00	1.00	0.50	358.	9.1	284.2	5.5	
05	10	12	285 05	-0.2	0.019	-9.000	-9.000	-999.	6.	2.9	0.40	1.00	1.00	0.30	301.	9.1	283.9	5.5	
05	10	12	285 06	-2.4	0.064	-9.000	-9.000	-999.	37.	9.7	0.40	1.00	1.00	1.00	195.	9.1	283.6	5.5	
05	10	12	285 07	-3.2	0.070	-9.000	-9.000	-999.	43.	9.9	0.40	1.00	0.48	1.10	162.	9.1	285.2	5.5	
05	10	12	285 08	53.9	0.144	0.777	0.018	314.	126.	-5.0	0.40	1.00	0.27	0.70	41.	9.1	289.2	5.5	
05	10	12	285 09	115.3	0.223	1.040	0.016	353.	243.	-8.7	0.40	1.00	0.21	1.20	161.	9.1	291.0	5.5	
05	10	12	285 10	161.7	0.316	1.223	0.014	409.	408.	-17.6	0.40	1.00	0.19	1.90	194.	9.1	293.8	5.5	
05	10	12	285 11	192.9	0.310	1.364	0.010	475.	396.	-13.9	0.40	1.00	0.19	1.80	210.	9.1	295.5	5.5	
05	10	12	285 12	205.8	0.370	1.460	0.007	547.	517.	-22.2	0.40	1.00	0.18	2.30	207.	9.1	297.1	5.5	
05	10	12	285 13	194.8	0.402	1.473	0.005	594.	586.	-30.1	0.40	1.00	0.19	2.60	205.	9.1	298.1	5.5	
05	10	12	285 14	167.8	0.374	1.551	0.005	804.	526.	-28.1	0.40	1.00	0.19	2.40	199.	9.1	299.4	5.5	
05	10	12	285 15	118.7	0.420	1.447	0.005	925.	626.	-56.4	0.40	1.00	0.20	2.90	233.	9.1	299.6	5.5	
05	10	12	285 16	60.1	0.426	1.177	0.005	981.	639.	-116.1	0.40	1.00	0.25	3.10	234.	9.1	298.6	5.5	
05	10	12	285 17	7.8	0.339	0.596	0.005	982.	459.	-453.4	0.40	1.00	0.40	2.60	220.	9.1	296.9	5.5	
05	10	12	285 18	-8.6	0.102	-9.000	-9.000	-999.	152.	11.2	0.40	1.00	1.00	1.60	223.	9.1	294.6	5.5	
05	10	12	285 19	-4.8	0.077	-9.000	-9.000	-999.	51.	8.4	0.40	1.00	1.00	1.20	205.	9.1	291.6	5.5	
05	10	12	285 20	-5.7	0.083	-9.000	-9.000	-999.	55.	9.1	0.40	1.00	1.00	1.30	189.	9.1	289.9	5.5	
05	10	12	285 21	-2.7	0.057	-9.000	-9.000	-999.	32.	6.3	0.40	1.00	1.00	0.90	200.	9.1	288.8	5.5	
05	10	12	285 22	-0.8	0.032	-9.000	-9.000	-999.	13.	3.5	0.40	1.00	1.00	0.50	73.	9.1	288.0	5.5	
05	10	12	285 23	-0.5	0.026	-9.000	-9.000	-999.	9.	2.8	0.40	1.00	1.00	0.40	31.	9.1	287.1	5.5	
05	10	12	285 24	-2.2	0.051	-9.000	-9.000	-999.	27.	5.5	0.40	1.00	1.00	0.80	7.	9.1	286.4	5.5	

First hour of profile data
 YR MO DY HR HEIGHT F WDIR WSPD AMB TMP sigmaA sigmaW sigmaV
 05 10 12 01 5.5 0 -999. -99.00 285.8 99.0 -99.00 -99.00
 05 10 12 01 9.1 1 44. 0.40 -999.0 99.0 -99.00 -99.00

F indicates top of profile (=1) or below (=0)
 • *** AERMOD - VERSION 09292 *** ** NO TITLE SPECIFIED *** 01/31/11
 *** 16:46:32
 *** PAGE 7

**MODELOPTs: RegDEFAULT CONC

ELEV

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 2 YEARS FOR SOURCE GROUP: ALL ***
 INCLUDING SOURCE(S): 16FO2000, 16FO2001, 16FO2002, 16FO2003, 16FO2004, 16FO2005,
 16FO2006, 16FO2007, 16FO2008, 16FO2009, 16FO200A, 16FO200B, 16FO200C, 16FO200D, 16FO200E, 16FO200F, 16FO200G, 16FO200H,
 16FO200I, 16FO200J, 16FO200K, 16FO200L, 16FO200M, 16FO200N,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER			IN MICROGRAMS/M**3			**		
X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
404690.90	3759703.00	844620.52096	405108.90	3759696.20	1094159.41351			
405273.60	3759694.80	1004057.85891	405272.70	3759668.30	673718.73420			
404690.40	3759678.30	526360.43011	405273.20	3759694.80	1006427.25090			
405361.00	3759693.40	919868.99133	405397.10	3759688.40	860268.38290			
405442.90	3759683.80	1009554.94077	405486.80	3759677.00	1051841.08923			
405524.70	3759682.50	1239561.40702	405560.90	3759707.60	1624549.47311			
405597.50	3759739.20	1522787.84679	405630.40	3759768.90	1640124.47984			
405674.80	3759831.60	522539.20871	405707.20	3759805.50	577899.60942			
405688.50	3759690.20	171529.22031	405633.60	3759688.90	493184.61038			
405615.30	3759664.20	405599.64647	405571.40	3759680.60	1567916.82869			
405541.20	3759657.30	1534503.44320	405479.90	3759647.20	1129951.52372			
405419.50	3759654.10	776766.07909	405366.00	3759663.70	731834.81824			
405325.30	3759670.60	639513.42142	405273.60	3759668.30	665581.43824			

• *** AERMOD - VERSION 09292 *** ** NO TITLE SPECIFIED *** 01/31/11
 *** 16:46:32
 *** PAGE 8

**MODELOPTs: RegDEFAULT CONC

ELEV

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 2 YEARS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Appendix B

GROUP ID	AVERAGE CONC	RECEPTOR	(XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID	
ALL	1ST HIGHEST VALUE IS 1640124.47984 AT (	405630.40,	3759768.90,	130.97,	414.00,	0.00) DC
	2ND HIGHEST VALUE IS 1624549.47311 AT (	405560.90,	3759707.60,	124.32,	414.00,	0.00) DC
	3RD HIGHEST VALUE IS 1567916.82869 AT (	405571.40,	3759680.60,	126.50,	414.00,	0.00) DC
	4TH HIGHEST VALUE IS 1534503.44320 AT (	405541.20,	3759657.30,	124.56,	414.00,	0.00) DC
	5TH HIGHEST VALUE IS 1522787.84679 AT (	405597.50,	3759739.20,	125.07,	414.00,	0.00) DC
	6TH HIGHEST VALUE IS 1239561.40702 AT (	405524.70,	3759682.50,	121.11,	414.00,	0.00) DC
	7TH HIGHEST VALUE IS 1129951.52372 AT (	405479.90,	3759647.20,	121.85,	414.00,	0.00) DC
	8TH HIGHEST VALUE IS 1094159.41351 AT (	405108.90,	3759696.20,	125.38,	389.00,	0.00) DC
	9TH HIGHEST VALUE IS 1051841.08923 AT (	405486.80,	3759677.00,	120.53,	414.00,	0.00) DC
	10TH HIGHEST VALUE IS 1009554.94077 AT (	405442.90,	3759683.80,	120.00,	414.00,	0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
 GP = GRIDPOLR
 DC = DISCCART
 DP = DISCPOLR

• *** AERMOD - VERSION 09292 *** *** NO TITLE SPECIFIED

*** 01/31/11
 *** 16:46:32
 PAGE 9

**MODELOPTs: RegDFAULT CONC

ELEV

*** Message Summary : AERMOD Model Execution ***

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)
 A Total of 2 Warning Message(s)
 A Total of 780 Informational Message(s)
 A Total of 19464 Hours Were Processed
 A Total of 0 Calm Hours Identified
 A Total of 780 Missing Hours Identified (4.01 Percent)

***** FATAL ERROR MESSAGES *****
 *** NONE ***

***** WARNING MESSAGES *****
 OU W565 110 PERPLT:Possible Conflict With Dynamically Allocated FUNIT PLOTFILE
 MX W481 19465 MAIN :Data Remaining After End of Year. Number of Hours= 1944

 *** AERMOD Finishes Successfully ***

Penn Street Modeling: Diesel Particulate Cancer Risk

Value	Description
0.001032	HHDT PM emissions, lb/mile, EMFAC2007 LA County 2011
10	Area source width, m
1	one way trips per day
3.37E-10	Emissions, g/m ² -s
1640000	Aermod results, per g/m ² -s
0.00055	Aermod results, DPM ug/m ³ max
1.10	DPM Cancer potency factor
302.00	Daily breathing rate, L/kg-day
0.96	Exposure value factor
1.00	Multipathway factor
0.18	DPM Cancer risk, per million, per truck trip
56.7	Number of one-way trips to be under 10 in a million
2.00	Construction years
1984	daily avg construction trips to be under sig criteria, averaged over 70 years
	Aermod modeling run, MICR location, 25m grid from SCAQMD HRA Assessment Procedures, version 7
	from SCAQMD HRA Assessment Procedures, version 7
	from SCAQMD HRA Assessment Procedures, version 7
	from SCAQMD HRA Assessment Procedures, version 7