APPENDIX A

PEAK EMISSION CALCULATIONS

This page intentionally left blank.

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Emission Summary

	Year 1							Year 2										
Emissions from Equipment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOC (lb/day)	6.39	6.39	3.50	6.54	6.17	5.62	4.81	5.19	5.73	4.92	4.22	3.67	2.89	2.86	3.19	2.99	2.57	2.23
CO (lb/day)	43.45	43.45	36.87	55.64	47.58	42.59	38.16	44.20	44.54	43.14	38.83	34.04	24.73	21.51	24.73	21.41	19.85	16.62
NOx (lb/day)	83.06	83.06	40.96	67.47	58.00	55.61	50.06	58.49	60.16	53.86	48.26	40.41	30.62	28.44	32.11	29.26	25.59	21.91
SOx (lb/day)	0.13	0.13	0.09	0.13	0.11	0.10	0.09	0.11	0.11	0.10	0.09	0.07	0.06	0.05	0.06	0.05	0.04	0.04
PM10 (lb/day)	4.26	4.26	2.46	4.11	3.65	3.42	2.93	3.41	3.61	3.26	2.81	2.51	1.89	1.74	2.01	1.83	1.56	1.28
PM2.5 (lb/day)[1]	4.17	4.17	2.41	4.02	3.58	3.35	2.87	3.34	3.54	3.20	2.75	2.46	1.85	1.71	1.97	1.79	1.53	1.26
CO_2 (lb/day)	6810.16	6810.16	4615.35	7058.81	5654.57	5404.14	4864.34	5783.81	6040.38	5560.02	5044.15	3920.31	2975.27	2771.22	3077.74	2719.65	2276.84	1970.32

	Year 1							Year 2										
Emission from Trips - Onsite/Offsite	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOC (lb/day)	1.03	1.00	1.33	1.69	2.15	2.15	2.09	2.19	2.22	2.20	1.44	1.43	1.43	0.96	0.77	0.77	0.48	0.39
CO (lb/day)	9.27	9.16	11.85	15.42	19.94	19.94	19.46	20.28	20.46	20.38	13.36	13.27	13.27	8.87	7.12	7.12	4.49	3.61
NOx (lb/day)	2.69	2.24	3.55	3.24	2.68	2.68	1.88	1.95	2.36	1.96	1.29	1.28	1.28	0.85	0.69	0.69	0.43	0.35
SOx (lb/day)	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
PM10 (lb/day)	5.85	5.22	8.74	10.01	11.22	11.22	10.31	1.67	2.12	1.68	1.10	1.09	1.09	0.73	0.59	0.59	0.37	0.30
Exhuast PM (lb/day)	0.20	0.19	0.27	0.31	0.35	0.35	0.32	0.36	0.37	0.36	0.24	0.24	0.24	0.16	0.13	0.13	0.08	0.06
Fugitive PM (lb/day)	5.65	5.03	8.47	9.70	10.88	10.88	9.99	1.31	1.74	1.32	0.86	0.86	0.86	0.57	0.46	0.46	0.29	0.23
PM2.5 (lb/day)[1]	1.16	1.04	1.71	1.96	2.20	2.20	2.01	0.58	0.67	0.59	0.38	0.38	0.38	0.26	0.20	0.20	0.13	0.10
Exhuast PM (lb/day)	0.20	0.19	0.27	0.31	0.35	0.35	0.32	0.36	0.37	0.36	0.24	0.24	0.24	0.16	0.13	0.13	0.08	0.06
Fugitive PM (lb/day)	0.96	0.86	1.44	1.65	1.85	1.85	1.70	0.22	0.30	0.22	0.15	0.15	0.15	0.10	0.08	0.08	0.05	0.04
CO_2 (lb/day)	1641.35	1550.83	2178.85	2631.80	3167.39	3167.39	2986.15	3537.87	3640.00	3554.51	2331.19	2314.54	2314.54	1547.88	1242.05	1242.05	783.30	629.35

	Year 1							Year 2										
Fugitive Earthmoving PM - Peak	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
PM10 (lb/day)[2]	20.32	20.32	20.32	20.32	20.32	20.32	20.32	20.32	20.32	20.32	20.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[1][2]	11.79	11.79	11.79	11.79	11.79	11.79	11.79	11.79	11.79	11.79	11.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 1							Year 2										
Offroad Fugitive PM - Peak	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
PM10 (lb/day)[2]	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36	11.36
PM2.5 (lb/day)[1][2]	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39

	Year 1							Year 2										
Paint	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.60	16.60	0.00	0.00	0.00	62.25	62.25

	Year 1							Year 2										
Fugitive VOC	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOC (lb/day)	0.00	0.00	3.26	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

		Year 1							Year 2										
Total Emissions[3]	**Thresholds**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
VOC (lb/day)	75	7.42	7.40	8.09	8.24	8.32	7.78	6.89	7.38	7.94	7.12	5.66	21.71	20.92	3.82	3.96	3.76	65.30	64.87
CO (lb/day)	550	52.72	52.61	48.72	71.06	67.52	62.53	57.62	64.48	65.01	63.52	52.20	47.31	38.00	30.38	31.85	28.53	24.34	20.23
NOx (lb/day)	100	85.75	85.30	44.51	70.71	60.68	58.29	51.94	60.44	62.52	55.82	49.55	41.69	31.90	29.29	32.80	29.94	26.02	22.26
SOx (lb/day)	150	0.14	0.14	0.11	0.16	0.14	0.13	0.12	0.14	0.15	0.14	0.12	0.10	0.08	0.07	0.07	0.06	0.05	0.04
PM10 (lb/day)[2]	150	41.80	41.17	42.89	45.80	46.56	46.33	44.92	36.77	37.41	36.63	35.60	14.97	14.34	13.84	13.96	13.78	13.29	12.95
PM2.5 (lb/day)[1][2]	55	19.51	19.39	18.30	20.15	19.95	19.72	19.06	18.10	18.38	17.96	17.31	5.23	4.62	4.35	4.56	4.39	4.04	3.75
CO_2 (tonnes/day)	NA	3.83	3.79	3.08	4.40	4.00	3.89	3.56	4.23	4.39	4.13	3.35	2.83	2.40	1.96	1.96	1.80	1.39	1.18
CO_2 (tonnes/yr)	NA							597.47											666.21
30yr amortized CO_2 (tonnes/yr)	NA																		42.12

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls

(2) Mitigated PM.

(3) Peak daily emissions are highlighed in yellow.

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Equipment Emission Rates

Equipment Type	Hp	2013 Emission Factors lb/hr[1]					
		VOC	CO	NOx	SOx	PM10	CO_{2EQ}
Crane	250	0.0778	0.2948	1.1241	0.0014	0.0516	73.3462
Fork Lift	120	0.0253	0.2176	0.2634	0.0004	0.0220	19.3615
Man Lift	120	0.0101	0.2425	0.1976	0.0005	0.0101	26.7116
Welder	Electric	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Air Compressor	50	0.0380	0.2546	0.1950	0.0004	0.0177	20.7119
Generator	50	0.0380	0.2639	0.1950	0.0004	0.0177	20.7119
Light Plant	50	0.0380	0.3456	0.1950	0.0004	0.0177	20.7119
Track Excavator	120	0.0306	0.5177	0.3698	0.0007	0.0278	36.1744
Scraper	250	0.1534	0.6408	2.2020	0.0024	0.1012	126.2025
Backhoe	120	0.0344	0.3529	0.3949	0.0007	0.0315	36.1695
Front End Loader	120	0.0344	0.3529	0.3949	0.0007	0.0315	36.1695
3-yd Loader	175	0.0438	0.5861	0.6229	0.0012	0.0315	61.7966
Grader	500	0.0660	0.6289	0.9806	0.0026	0.0373	140.4933
Skip Loader	120	0.0344	0.3529	0.3949	0.0007	0.0315	36.1695
Trash Pump	50	0.0339	0.1004	0.1493	0.0003	0.0147	15.6525
Trash Pump	50	0.0339	0.3116	0.1493	0.0003	0.0147	15.6525
Ditch Witch	50	0.0471	0.1355	0.2428	0.0005	0.0224	26.1733
Roller	120	0.0436	0.4063	0.4850	0.0007	0.0362	38.3436

(1) OFFROAD2011 emissions except for CO, which are from the OFFROAD2007.

Equipment Type	Hp	2014 Emission Factors lb/hr[1]					
		VOC	CO	NOx	SOx	PM10	CO_{2EQ}
Crane	250	0.0753	0.2817	1.0834	0.0014	0.0497	73.3415
Fork Lift	120	0.0240	0.2158	0.2500	0.0004	0.0209	19.3615
Man Lift	120	0.0084	0.2400	0.1696	0.0005	0.0081	26.7116
Welder	Electric	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Air Compressor	50	0.0374	0.2446	0.1937	0.0004	0.0175	20.7137
Generator	50	0.0374	0.2545	0.1937	0.0004	0.0175	20.7137
Light Plant	50	0.0374	0.3331	0.1937	0.0004	0.0175	20.7137
Track Excavator	120	0.0292	0.5137	0.3533	0.0007	0.0263	36.1863
Scraper	250	0.1467	0.6146	2.1091	0.0024	0.0964	126.1285
Backhoe	120	0.0323	0.3503	0.3747	0.0007	0.0294	36.0979
Front End Loader	120	0.0323	0.3503	0.3747	0.0007	0.0294	36.0979
3-yd Loader	175	0.0409	0.5857	0.5774	0.0012	0.0290	61.7668
Grader	500	0.0686	0.5992	0.9810	0.0026	0.0377	140.4799
Skip Loader	120	0.0323	0.3503	0.3747	0.0007	0.0294	36.0979
Trash Pump	50	0.0332	0.0959	0.1476	0.0003	0.0144	15.6525
Trash Pump	50	0.0332	0.3004	0.1476	0.0003	0.0144	15.6525
Ditch Witch	50	0.0462	0.1355	0.2404	0.0005	0.0221	26.1684
Roller	120	0.0413	0.4030	0.4591	0.0007	0.0342	38.3145

(1) OFFROAD2011 emissions except for CO, which are from the OFFROAD2007.

Equipment Type	Hp	2015 Emission Factors lb/hr[1]					
		VOC	CO	NOx	SOx	PM10	CO_{2EQ}
Crane	250	0.0567	0.2713	0.5684	0.0006	0.0422	29.8511
Fork Lift	120	0.0232	0.2143	0.2409	0.0004	0.0202	19.3615
Man Lift	120	0.0079	0.2377	0.1566	0.0005	0.0072	26.7116
Welder	Electric	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Air Compressor	50	0.0377	0.2360	0.1937	0.0004	0.0175	20.7115
Generator	50	0.0377	0.2465	0.1937	0.0004	0.0175	20.7115
Light Plant	50	0.0377	0.3227	0.1937	0.0004	0.0175	20.7115
Track Excavator	120	0.0289	0.5102	0.3456	0.0007	0.0257	36.1904
Scraper	250	0.1443	0.5906	2.0728	0.0024	0.0946	126.1095
Backhoe	120	0.0316	0.3480	0.3641	0.0007	0.0285	36.0740
Front End Loader	120	0.0316	0.3480	0.3641	0.0007	0.0285	36.0740
3-yd Loader	175	0.0407	0.5853	0.5655	0.0012	0.0286	61.7679
Grader	500	0.0712	0.5739	0.9830	0.0026	0.0381	140.4726
Skip Loader	120	0.0316	0.3480	0.3641	0.0007	0.0285	36.0740
Trash Pump	50	0.0327	0.0919	0.1461	0.0003	0.0141	15.6525
Trash Pump	50	0.0327	0.2910	0.1461	0.0003	0.0141	15.6525
Ditch Witch	50	0.0458	0.1355	0.2382	0.0005	0.0217	26.1595
Roller	120	0.0406	0.4000	0.4506	0.0007	0.0336	38.3134

(1) OFFROAD2011 emissions except for CO, which are from the OFFROAD2007.

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Equipment Emissions

		Year 1											
Equipment	**Hours (hr/day)**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	6									2	3	3	3
Fork Lift	2						1	1	2	2	3	3	3
Man Lift	8									4	4	4	4
Welder	8									8	8	8	8
Air Compressor	8						2	2	2	2	2	2	2
Generator	8									3	3	3	3
Light Plant	8										2	2	2
Track Excavator	8								2				
Scraper	7						3	3					
Backhoe	4								1	2	2	2	2
Front End Loader	8						1	1	1	1	1	1	0
3-yd Loader	8						1	1	1	1			
Grader	8						2	2	2	2	1	1	1
Skip Loader	4						1	1	1	2			
Trash Pump	8									2	2	2	
Trash Pump	8									2	2		
Ditch Witch	8												
Roller	8						2	2	1	1			

	Emission Rate (lb/hr)	Year 1											
VOC	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	0.078	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.40	1.40	1.40
Fork Lift	0.025	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.10	0.10	0.15	0.15	0.15
Man Lift	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.32
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.038	0.00	0.00	0.00	0.00	0.00	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Generator	0.038	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.91	0.91
Light Plant	0.038	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.61	0.61
Track Excavator	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00
Scraper	0.153	0.00	0.00	0.00	0.00	0.00	3.22	3.22	0.00	0.00	0.00	0.00	0.00
Backhoe	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.27	0.27	0.27	0.27
Front End Loader	0.034	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.27	0.27	0.27	0.27	0.00
3-yd Loader	0.044	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.35	0.35	0.00	0.00	0.00
Grader	0.066	0.00	0.00	0.00	0.00	0.00	1.06	1.06	1.06	1.06	0.53	0.53	0.53
Skip Loader	0.034	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.27	0.00	0.00	0.00
Trash Pump	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.54	0.54	0.00
Trash Pump	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.54	0.00	0.00
Ditch Witch	0.047	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.044	0.00	0.00	0.00	0.00	0.00	0.70	0.70	0.35	0.35	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	6.39	6.39	3.50	6.54	6.17	5.62	4.81

	Emission Rate (lb/hr)	Year 1											
CO	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	0.295	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	5.31	5.31	5.31
Fork Lift	0.218	0.00	0.00	0.00	0.00	0.00	0.44	0.44	0.87	0.87	1.31	1.31	1.31
Man Lift	0.243	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.76	7.76	7.76	7.76
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.255	0.00	0.00	0.00	0.00	0.00	4.07	4.07	4.07	4.07	4.07	4.07	4.07
Generator	0.264	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.33	6.33	6.33	6.33
Light Plant	0.346	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.53	5.53	5.53
Track Excavator	0.518	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.28	0.00	0.00	0.00	0.00
Scraper	0.641	0.00	0.00	0.00	0.00	0.00	13.46	13.46	0.00	0.00	0.00	0.00	0.00
Backhoe	0.353	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	2.82	2.82	2.82	2.82
Front End Loader	0.353	0.00	0.00	0.00	0.00	0.00	2.82	2.82	2.82	2.82	2.82	2.82	0.00
3-yd Loader	0.586	0.00	0.00	0.00	0.00	0.00	4.69	4.69	4.69	4.69	0.00	0.00	0.00
Grader	0.629	0.00	0.00	0.00	0.00	0.00	10.06	10.06	10.06	10.06	5.03	5.03	5.03
Skip Loader	0.353	0.00	0.00	0.00	0.00	0.00	1.41	1.41	1.41	2.82	0.00	0.00	0.00
Trash Pump	0.100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.61	1.61	0.00
Trash Pump	0.312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.99	4.99	0.00	0.00
Ditch Witch	0.136	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.406	0.00	0.00	0.00	0.00	0.00	6.50	6.50	3.25	3.25	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	43.45	43.45	36.87	55.64	47.58	42.59	38.16

	Emission Rate (lb/hr)	Year 1											
NOX	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	1.124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.49	20.23	20.23	20.23
Fork Lift	0.263	0.00	0.00	0.00	0.00	0.00	0.53	0.53	1.05	1.05	1.58	1.58	1.58
Man Lift	0.198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.32	6.32	6.32	6.32
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.195	0.00	0.00	0.00	0.00	0.00	3.12	3.12	3.12	3.12	3.12	3.12	3.12
Generator	0.195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.68	4.68	4.68	4.68
Light Plant	0.195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.12	3.12	3.12
Track Excavator	0.370	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.92	0.00	0.00	0.00	0.00
Scraper	2.202	0.00	0.00	0.00	0.00	0.00	46.24	46.24	0.00	0.00	0.00	0.00	0.00
Backhoe	0.395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.58	3.16	3.16	3.16	3.16
Front End Loader	0.395	0.00	0.00	0.00	0.00	0.00	3.16	3.16	3.16	3.16	3.16	3.16	0.00
3-yd Loader	0.623	0.00	0.00	0.00	0.00	0.00	4.98	4.98	4.98	4.98	0.00	0.00	0.00
Grader	0.981	0.00	0.00	0.00	0.00	0.00	15.69	15.69	15.69	15.69	7.85	7.85	7.85
Skip Loader	0.395	0.00	0.00	0.00	0.00	0.00	1.58	1.58	1.58	3.16	0.00	0.00	0.00
Trash Pump	0.149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.39	2.39	2.39	0.00
Trash Pump	0.149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.39	2.39	0.00	0.00
Ditch Witch	0.243	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.485	0.00	0.00	0.00	0.00	0.00	7.76	7.76	3.88	3.88	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	83.06	83.06	40.96	67.47	58.00	55.61	50.06

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Equipment Emissions

	Emission Rate (lb/hr)	Year 1											
SOx	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02
Fork Lift	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.000	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Generator	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Light Plant	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Track Excavator	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Scraper	0.002	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00
Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Front End Loader	0.001	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00
3-yd Loader	0.001	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Grader	0.003	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.02	0.02	0.02
Skip Loader	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Trash Pump	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trash Pump	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.001	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.09	0.13	0.11	0.10	0.09

	Emission Rate (lb/hr)	Year 1											
PM10	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.93	0.93	0.93
Fork Lift	0.022	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.09	0.09	0.13	0.13	0.13
Man Lift	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.32
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.018	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Generator	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.43	0.43	0.43
Light Plant	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.28
Track Excavator	0.028	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00
Scraper	0.101	0.00	0.00	0.00	0.00	0.00	2.13	2.13	0.00	0.00	0.00	0.00	0.00
Backhoe	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.25	0.25	0.25	0.25
Front End Loader	0.031	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.00
3-yd Loader	0.032	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.25	0.00	0.00	0.00
Grader	0.037	0.00	0.00	0.00	0.00	0.00	0.60	0.60	0.60	0.60	0.30	0.30	0.30
Skip Loader	0.031	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.13	0.25	0.00	0.00	0.00
Trash Pump	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.24	0.00
Trash Pump	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.00	0.00
Ditch Witch	0.022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.036	0.00	0.00	0.00	0.00	0.00	0.58	0.58	0.29	0.29	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	4.26	4.26	2.46	4.11	3.65	3.42	2.93

	Emission Rate (lb/hr)	Year 1											
CO2EQ	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Crane	73.346	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	880.15	1320.23	1320.23	1320.23
Fork Lift	19.362	0.00	0.00	0.00	0.00	0.00	38.72	38.72	77.45	77.45	116.17	116.17	116.17
Man Lift	26.712	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	854.77	854.77	854.77	854.77
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	20.712	0.00	0.00	0.00	0.00	0.00	331.39	331.39	331.39	331.39	331.39	331.39	331.39
Generator	20.712	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	497.09	497.09	497.09	497.09
Light Plant	20.712	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	331.39	331.39	331.39
Track Excavator	36.174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	578.79	0.00	0.00	0.00	0.00
Scraper	126.202	0.00	0.00	0.00	0.00	0.00	2650.25	2650.25	0.00	0.00	0.00	0.00	0.00
Backhoe	36.169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.68	289.36	289.36	289.36	289.36
Front End Loader	36.169	0.00	0.00	0.00	0.00	0.00	289.36	289.36	289.36	289.36	289.36	289.36	0.00
3-yd Loader	61.797	0.00	0.00	0.00	0.00	0.00	494.37	494.37	494.37	494.37	0.00	0.00	0.00
Grader	140.493	0.00	0.00	0.00	0.00	0.00	2247.89	2247.89	2247.89	2247.89	1123.95	1123.95	1123.95
Skip Loader	36.169	0.00	0.00	0.00	0.00	0.00	144.68	144.68	144.68	289.36	0.00	0.00	0.00
Trash Pump	15.652	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	250.44	250.44	250.44	0.00
Trash Pump	15.652	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	250.44	250.44	0.00	0.00
Ditch Witch	26.173	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	38.344	0.00	0.00	0.00	0.00	0.00	613.50	613.50	306.75	306.75	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	6810.16	6810.16	4615.35	7058.81	5654.57	5404.14	4864.34

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Equipment Emissions

		Year 2											
Equipment	**Hours (hr/day)**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	6	3	3	2	2	2	2	2	2	2	2	2	
Fork Lift	2	3	3										
Man Lift	8	4	4	4	4	4	4	4	4	3	2	2	
Welder	8	8	8	8	8	8	8	8	8	8	6	6	
Air Compressor	8	2	2	1	1	1	1						
Generator	8	3	3	3	3	3	3	3	3	3	2	2	
Light Plant	8										2	2	
Track Excavator	8												
Scraper	8												
Backhoe	4	2	2	1	1	1	2						
Front End Loader	8	0	0	1	1	1							
3-yd Loader	8	1	1	1	1	1							
Grader	8	1	1	1	1								
Skip Loader	4	1	2	2	2	2	2	2	2	1			
Trash Pump	8							2	2	2			
Trash Pump	8												
Ditch Witch	8		2	1									
Roller	8	2	1	2	1	1			1	1	1		

	Emission Rate (lb/hr)	**Year 2**											
VOC	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	0.075	1.35	1.35	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.00
Fork Lift	0.024	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.008	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.20	0.13	0.13	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.037	0.60	0.60	0.30	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0.037	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.60	0.60	0.00
Light Plant	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.60	0.00
Track Excavator	0.029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	0.147	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0.032	0.26	0.26	0.13	0.13	0.13	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	0.032	0.00	0.00	0.26	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	0.041	0.33	0.33	0.33	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0.069	0.55	0.55	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	0.032	0.13	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.13	0.00	0.00	0.00
Trash Pump	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.53	0.53	0.00	0.00	0.00
Trash Pump	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.046	0.00	0.74	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.041	0.66	0.33	0.66	0.33	0.33	0.00	0.00	0.33	0.33	0.33	0.00	0.00
Total		5.19	5.73	4.92	4.22	3.67	2.89	2.86	3.19	2.99	2.57	2.23	0.00

	Emission Rate (lb/hr)	**Year 2**											
CO	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	0.282	5.07	5.07	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	0.00
Fork Lift	0.216	1.29	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.240	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	5.76	3.84	3.84	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.245	3.91	3.91	1.96	1.96	1.96	1.96	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0.254	6.11	6.11	6.11	6.11	6.11	6.11	6.11	6.11	6.11	4.07	4.07	0.00
Light Plant	0.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.33	5.33	0.00
Track Excavator	0.514	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	0.615	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0.350	2.80	2.80	1.40	1.40	1.40	2.80	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	0.350	0.00	0.00	2.80	2.80	2.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	0.586	4.69	4.69	4.69	4.69	4.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0.599	4.79	4.79	4.79	4.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	0.350	1.40	2.80	2.80	2.80	2.80	2.80	2.80	2.80	1.40	0.00	0.00	0.00
Trash Pump	0.096	0.00	0.00	0.00	0.00	0.00	0.00	1.53	1.53	1.53	0.00	0.00	0.00
Trash Pump	0.300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.136	0.00	2.17	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.403	6.45	3.22	6.45	3.22	3.22	0.00	0.00	3.22	3.22	3.22	0.00	0.00
Total		44.20	44.54	43.14	38.83	34.04	24.73	21.51	24.73	21.41	19.85	16.62	0.00

	Emission Rate (lb/hr)	**Year 2**											
NOX	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	1.083	19.50	19.50	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	
Fork Lift	0.250	1.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.170	5.43	5.43	5.43	5.43	5.43	5.43	5.43	5.43	4.07	2.71	2.71	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.194	3.10	3.10	1.55	1.55	1.55	1.55	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0.194	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	3.10	3.10	0.00
Light Plant	0.194	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	3.10	0.00
Track Excavator	0.353	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	2.109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0.375	3.00	3.00	1.50	1.50	1.50	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	0.375	0.00	0.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	0.577	4.62	4.62	4.62	4.62	4.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0.981	7.85	7.85	7.85	7.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	0.375	1.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	1.50	0.00	0.00	0.00
Trash Pump	0.148	0.00	0.00	0.00	0.00	0.00	0.00	2.36	2.36	2.36	0.00	0.00	0.00
Trash Pump	0.148	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.240	0.00	3.85	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.459	7.35	3.67	7.35	3.67	3.67	0.00	0.00	3.67	3.67	3.67	0.00	0.00
Total		58.49	60.16	53.86	48.26	40.41	30.62	28.44	32.11	29.26	25.59	21.91	0.00

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Construction Equipment Emissions

	Emission Rate (lb/hr)	Year 2											
SOx	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	0.001	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00
Fork Lift	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.001	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.000	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0.000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Light Plant	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Track Excavator	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0.001	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	0.001	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	0.001	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0.003	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	0.001	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Trash Pump	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trash Pump	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.000	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.001	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Total		0.11	0.11	0.10	0.09	0.07	0.06	0.05	0.06	0.05	0.04	0.04	0.00

	Emission Rate (lb/hr)	Year 2											
PM10	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	0.050	0.89	0.89	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.00
Fork Lift	0.021	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	0.008	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.19	0.13	0.13	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	0.017	0.28	0.28	0.14	0.14	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0.017	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.28	0.28	0.00
Light Plant	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.00
Track Excavator	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	0.096	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0.029	0.24	0.24	0.12	0.12	0.12	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	0.029	0.00	0.00	0.24	0.24	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	0.029	0.23	0.23	0.23	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0.038	0.30	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	0.029	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.12	0.00	0.00	0.00
Trash Pump	0.014	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.23	0.00	0.00	0.00
Trash Pump	0.014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	0.022	0.00	0.35	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	0.034	0.55	0.27	0.55	0.27	0.27	0.00	0.00	0.27	0.27	0.27	0.00	0.00
Total		3.41	3.61	3.26	2.81	2.51	1.89	1.74	2.01	1.83	1.56	1.28	0.00

	Emission Rate (lb/hr)	Year 2											
CO2EQ	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Crane	73.341	1320.15	1320.15	880.10	880.10	880.10	880.10	880.10	880.10	880.10	880.10	880.10	0.00
Fork Lift	19.362	116.17	116.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Man Lift	26.712	854.77	854.77	854.77	854.77	854.77	854.77	854.77	854.77	641.08	427.39	427.39	0.00
Welder	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressor	20.714	331.42	331.42	165.71	165.71	165.71	165.71	0.00	0.00	0.00	0.00	0.00	0.00
Generator	20.714	497.13	497.13	497.13	497.13	497.13	497.13	497.13	497.13	497.13	331.42	331.42	0.00
Light Plant	20.714	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	331.42	331.42	0.00
Track Excavator	36.186	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scraper	126.128	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	36.098	288.78	288.78	144.39	144.39	144.39	288.78	0.00	0.00	0.00	0.00	0.00	0.00
Front End Loader	36.098	0.00	0.00	288.78	288.78	288.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-yd Loader	61.767	494.13	494.13	494.13	494.13	494.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	140.480	1123.84	1123.84	1123.84	1123.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skip Loader	36.098	144.39	288.78	288.78	288.78	288.78	288.78	288.78	288.78	144.39	0.00	0.00	0.00
Trash Pump	15.652	0.00	0.00	0.00	0.00	0.00	0.00	250.44	250.44	250.44	0.00	0.00	0.00
Trash Pump	15.652	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ditch Witch	26.168	0.00	418.69	209.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roller	38.314	613.03	306.52	613.03	306.52	306.52	0.00	0.00	306.52	306.52	306.52	0.00	0.00
Total		5783.81	6040.38	5560.02	5044.15	3920.31	2975.27	2771.22	3077.74	2719.65	2276.84	1970.32	0.00

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Onsite Construction Vehicle Trip Emissions

		Year 1											
Vehicle	**Miles per Day**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Commuters	40	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	1						4	4	4	4	4	4	4
Total Light Vehicle Miles		0	0	0	0	0	4	4	4	4	4	4	4
Flatbed Truck	5												
Stakebed Truck	5												
Boom Truck	5												
Buses	5												
Haul Trucks	5						2	2	2	2	2	2	
Dump Truck	10						4	4					
Water Truck	5						2	2	2	2			
Total Medium Truck Miles		0	0	0	0	0	60	60	20	20	10	10	0
Semi Tractor	1						1			1			
Concrete Truck	1								4	2	1	1	
Total Heavy Truck Miles		0	0	0	0	0	1	0	4	3	1	1	0

	Emission Rate (lb/mi)[1]	**Year 1 Emissions (lb/day)**											
VOC	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0007048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0011406	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.02	0.02	0.01	0.01	0.00
Heavy Duty	0.0010927	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.03	0.03	0.02	0.02	0.00
CO	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0065732	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Medium Duty	0.0090458	0.00	0.00	0.00	0.00	0.00	0.54	0.54	0.18	0.18	0.09	0.09	0.00
Heavy Duty	0.0052059	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.01	0.01	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.57	0.57	0.23	0.22	0.12	0.12	0.03
NOx	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0006348	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0111055	0.00	0.00	0.00	0.00	0.00	0.67	0.67	0.22	0.22	0.11	0.11	0.00
Heavy Duty	0.0217857	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.09	0.07	0.02	0.02	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.69	0.67	0.31	0.29	0.14	0.14	0.00
SOx	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0000101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000384	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty Exhaust	0.0001067	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0004298	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.01	0.01	0.00	0.00	0.00
Heavy Duty Exhaust	0.0008211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.01	0.01	0.01	0.01	0.00
Light Duty Fugitive[2]	0.00337564	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Fugitve[2]	0.00713657	0.00	0.00	0.00	0.00	0.00	0.43	0.43	0.14	0.14	0.07	0.07	0.00
Heavy Duty Fugitive[2]	0.02934884	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.12	0.09	0.03	0.03	0.00
Total Fugitive PM		0.00	0.00	0.00	0.00	0.00	0.47	0.44	0.27	0.24	0.11	0.11	0.01
Total		0.00	0.00	0.00	0.00	0.00	0.50	0.47	0.29	0.26	0.12	0.12	0.01
CO_{2EQ}	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	1.009	0.00	0.00	0.00	0.00	0.00	4.04	4.04	4.04	4.04	4.04	4.04	4.04
Medium Duty	2.486	0.00	0.00	0.00	0.00	0.00	149.15	149.15	49.72	49.72	24.86	24.86	0.00
Heavy Duty	4.311	0.00	0.00	0.00	0.00	0.00	4.31	0.00	17.24	12.93	4.31	4.31	0.00
Total		0.00	0.00	0.00	0.00	0.00	157.49	153.18	70.99	66.68	33.20	33.20	4.04

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, December 2003

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Where: k = 0.016 lb/VMT for PM10, sL = road silt loading (gms/m2) from CARB Methodology 7.9 for paved roads (0.240 for local roads and 0.037 for major/collector roads), W = weight of vehicles (2.4 tons for light; 5 for medium trucks, and 20 for heavy trucks), and C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 lbs/VMT).

(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011 and CH4 emissions factors are from Emfac2007

where light vehicle N2O = CH4*0.001/0.0005 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

where medium/heavy duty vehicle N2O = CH4*.0051/0.0048 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

	2013		
Chemical	**Light**	**Medium**	**Heavy**
CO_2	1.0000	2.3415	4.0287
CH_4	0.0001	0.0001	0.0001
CO_E	1.043	2.372	4.061

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Onsite Construction Vehicle Trip Emissions

		Year 2											
Vehicle	**Miles per Day**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Commuters	40	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	1	4	4	4	4	4	4	2	2	2	2	1	0
Total Light Vehicle Miles		4	4	4	4	4	4	2	2	2	2	1	0
Flatbed Truck	5												
Stakebed Truck	5												
Boom Truck	5												
Buses	5												
Haul Trucks	5												
Dump Truck	10												
Water Truck	5												
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Semi Tractor	1												
Concrete Truck	1		1										
Total Heavy Truck Miles		0	1	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)[1]	**Year 2 Emissions (lb/day)**											
VOC	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0006440	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0010068	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0008507	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0059632	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Medium Duty	0.0080776	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0041638	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00
NOx	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0005739	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0101198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0191762	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0000101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000386	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty Exhaust	0.0001061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0003418	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0005596	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Duty Fugitive[2]	0.000386	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Fugitve[2]	0.002104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.020119	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_{2EQ}	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	1.040	4.16	4.16	4.16	4.16	4.16	4.16	2.08	2.08	2.08	2.08	1.04	0.00
Medium Duty	2.400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	4.071	0.00	4.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		4.16	8.23	4.16	4.16	4.16	4.16	2.08	2.08	2.08	2.08	1.04	0.00

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, December 2003

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Where: k = 0.016 lb/VMT for PM10, sL = road silt loading (gms/m2) from CARB Methodology 7.9 for paved roads (0.240 for local roads and 0.037 for major/collector roads), W = weight of vehicles (2.4 tons for light; 5 for medium trucks, and 20 for heavy trucks), and C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 lbs/VMT).

(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011 and CH4 emissions factors are from Emfac2007

where light vehicle N2O = CH4*0.001/0.0005 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

where medium/heavy duty vehicle N2O = CH4*.0051/0.0048 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

	2014		
Chemical	**Light**	**Medium**	**Heavy**
CO_2	0.9998	2.3722	4.0420
CH_4	0.0001	0.0001	0.0001
CO_E	1.040	2.400	4.071

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Offsite Construction Vehicle Trip Emissions

		Year 1												
Vehicle	**Miles per Day**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Commuters	29.4						40	40	55	75	100	100	100
Pickup Trucks	16						2	2	2	2	2	2	1
Total Light Vehicle Miles		0	0	0	0	0	1208	1208	1649	2237	2972	2972	2956
Flatbed Truck	16												
Stakebed Truck	16												
Boom Truck	16												
Buses	16												
Haul Trucks	20						2	2	2	1	1	1	
Dump Truck	8						4	4					
Water Truck	16												
Total Medium Truck Miles		0	0	0	0	0	72	72	40	20	20	20	0
Semi Tractor	20						1			1			
Concrete Truck	20								4	2	1	1	
Total Heavy Truck Miles		0	0	0	0	0	20	0	80	60	20	20	0

	Emission Rate (lb/mi)[1]	**Year 1 Emissions (lb/day)**											
VOC	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0007048	0.00	0.00	0.00	0.00	0.00	0.85	0.85	1.16	1.58	2.09	2.09	2.08
Medium Duty	0.0011406	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.05	0.02	0.02	0.02	0.00
Heavy Duty	0.0010927	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.09	0.07	0.02	0.02	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.96	0.93	1.30	1.67	2.14	2.14	2.08
CO	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0065732	0.00	0.00	0.00	0.00	0.00	7.94	7.94	10.84	14.70	19.54	19.54	19.43
Medium Duty	0.0090458	0.00	0.00	0.00	0.00	0.00	0.65	0.65	0.36	0.18	0.18	0.18	0.00
Heavy Duty	0.0052059	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.42	0.31	0.10	0.10	0.00
Total		0.00	0.00	0.00	0.00	0.00	8.70	8.59	11.62	15.20	19.82	19.82	19.43
NOx	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0006348	0.00	0.00	0.00	0.00	0.00	0.77	0.77	1.05	1.42	1.89	1.89	1.88
Medium Duty	0.0111055	0.00	0.00	0.00	0.00	0.00	0.80	0.80	0.44	0.22	0.22	0.22	0.00
Heavy Duty	0.0217857	0.00	0.00	0.00	0.00	0.00	0.44	0.00	1.74	1.31	0.44	0.44	0.00
Total		0.00	0.00	0.00	0.00	0.00	2.00	1.57	3.23	2.95	2.54	2.54	1.88
SOx	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	0.0000101	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.03
Medium Duty	0.0000227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000384	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.03	0.03	0.03	0.03
PM10	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty Exhaust	0.0001067	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.18	0.24	0.32	0.32	0.32
Medium Duty Exhaust	0.0004298	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.01	0.01	0.01	0.00
Heavy Duty Exhaust	0.0008211	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.07	0.05	0.02	0.02	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.18	0.16	0.26	0.30	0.34	0.34	0.32
Light Duty Fugitive[2]	0.00337564	0.00	0.00	0.00	0.00	0.00	4.08	4.08	5.57	7.55	10.03	10.03	9.98
Medium Duty Fugitve[2]	0.00713657	0.00	0.00	0.00	0.00	0.00	0.51	0.51	0.29	0.14	0.14	0.14	0.00
Heavy Duty Fugitive[2]	0.02934884	0.00	0.00	0.00	0.00	0.00	0.59	0.00	2.35	1.76	0.59	0.59	0.00
Total Fugitive PM		0.00	0.00	0.00	0.00	0.00	5.18	4.59	8.20	9.45	10.76	10.76	9.98
Total		0.00	0.00	0.00	0.00	0.00	5.35	4.75	8.46	9.75	11.10	11.10	10.29
CO_{2EQ}	**2013**						**1**	**2**	**3**	**4**	**5**	**6**	**7**
Light Duty	1.009	0.00	0.00	0.00	0.00	0.00	1218.67	1218.67	1663.57	2256.76	2998.26	2998.26	2982.12
Medium Duty	2.486	0.00	0.00	0.00	0.00	0.00	178.98	178.98	99.43	49.72	49.72	49.72	0.00
Heavy Duty	4.311	0.00	0.00	0.00	0.00	0.00	86.21	0.00	344.85	258.64	86.21	86.21	0.00
Total		0.00	0.00	0.00	0.00	0.00	1483.86	1397.65	2107.85	2565.12	3134.19	3134.19	2982.12

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, December 2003

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Where: k = 0.016 lb/VMT for PM10, sL = road silt loading (gms/m2) from CARB Methodology 7.9 for paved roads (0.240 for local roads and 0.037 for major/collector roads), W = weight of vehicles (2.4 tons for light; 5 for medium trucks, and 20 for heavy trucks), and C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 lbs/VMT).

(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011 and CH4 emissions factors are from Emfac2007

where light vehicle N2O = CH4*0.001/0.0005 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

where medium/heavy duty vehicle N2O = CH4*.0051/0.0048 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

	2013		
Chemical	**Light**	**Medium**	**Heavy**
CO_2	1.0000	2.3415	4.0287
CH_4	0.0001	0.0001	0.0001
CO_E	1.043	2.372	4.061

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Offsite Construction Vehicle Trip Emissions

		Year 2											
Vehicle	**Miles per Day**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Commuters	29.4	115	115	115	75	75	75	50	40	40	25	20	
Pickup Trucks	16	1	2	2	2	1	1	1	1	1	1	1	
Total Light Vehicle Miles		3397	3413	3413	2237	2221	2221	1486	1192	1192	751	604	0
Flatbed Truck	16												
Stakebed Truck	16												
Boom Truck	16												
Buses	16												
Haul Trucks	20												
Dump Truck	8												
Water Truck	16												
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Semi Tractor	20												
Concrete Truck	20		1										
Total Heavy Truck Miles		0	20	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)[1]	**Year 2 Emissions (lb/day)**											
VOC	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0006440	2.19	2.20	2.20	1.44	1.43	1.43	0.96	0.77	0.77	0.48	0.39	0.00
Medium Duty	0.0010068	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0008507	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		2.19	2.22	2.20	1.44	1.43	1.43	0.96	0.77	0.77	0.48	0.39	0.00
CO	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0059632	20.26	20.35	20.35	13.34	13.24	13.24	8.86	7.11	7.11	4.48	3.60	0.00
Medium Duty	0.0080776	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0041638	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		20.26	20.44	20.35	13.34	13.24	13.24	8.86	7.11	7.11	4.48	3.60	0.00
NOx	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0005739	1.95	1.96	1.96	1.28	1.27	1.27	0.85	0.68	0.68	0.43	0.35	0.00
Medium Duty	0.0101198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0191762	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.95	2.34	1.96	1.28	1.27	1.27	0.85	0.68	0.68	0.43	0.35	0.00
SOx	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	0.0000101	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Medium Duty	0.0000230	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000386	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.03	0.04	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00
PM10	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty Exhaust	0.0001061	0.36	0.36	0.36	0.24	0.24	0.24	0.16	0.13	0.13	0.08	0.06	0.00
Medium Duty Exhaust	0.0003418	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0005596	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.36	0.37	0.36	0.24	0.24	0.24	0.16	0.13	0.13	0.08	0.06	0.00
Light Duty Fugitive[2]	0.000386	1.31	1.32	1.32	0.86	0.86	0.86	0.57	0.46	0.46	0.29	0.23	0.00
Medium Duty Fugitve[2]	0.002104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.020119	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		1.31	1.72	1.32	0.86	0.86	0.86	0.57	0.46	0.46	0.29	0.23	0.00
Total		1.67	2.09	1.68	1.10	1.09	1.09	0.73	0.59	0.59	0.37	0.30	0.00
CO_{2EQ}	**2014**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	
Light Duty	1.040	3533.71	3550.35	3550.35	2327.03	2310.38	2310.38	1545.80	1239.97	1239.97	781.22	628.31	0.00
Medium Duty	2.400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	4.071	0.00	81.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		3533.71	3631.77	3550.35	2327.03	2310.38	2310.38	1545.80	1239.97	1239.97	781.22	628.31	0.00

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, December 2003

$E = k(sL/2)^{0.65} x (W/3)^{1.5} - C$

Where: k = 0.016 lb/VMT for PM10, sL = road silt loading (gms/m2) from CARB Methodology 7.9 for paved roads (0.240 for local roads and 0.037 for major/collector roads), W = weight of vehicles (2.4 tons for light; 5 for medium trucks, and 20 for heavy trucks), and C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 lbs/VMT).

(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011 and CH4 emissions factors are from Emfac2007

where light vehicle N2O = CH4*0.001/0.0005 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

where medium/heavy duty vehicle N2O = CH4*.0051/0.0048 EPA Direct Emissions from Mobile Combustion Sources (May 2008)

	2014		
Chemical	**Light**	**Medium**	**Heavy**
CO_2	0.9998	2.3722	4.0420
CH_4	0.0001	0.0001	0.0001
CO_E	1.040	2.400	4.071

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Offroad Construction Vehicle Dust Emissions

Vehicle	Miles/Trip	Trips/Day
Mechanics Trucks	0.05	4
Total Light Vehicle Miles		0.2
Delivery Trucks	0.05	0
Total Medium Truck Miles		0
Haul Trucks	0.05	2
Dump Trucks	0.05	4
Water Trucks	0.5	3
Total Heavy Truck Miles		1.8
Backhoe	0.5	3
Loader	0.5	2
Trencher	0.5	2
Excavator	1	2
Grader/Scraper	1	6
Total Heavy-Heavy Duty Miles		11.5

PM10	Emission Rate (lb/mi)[1]	Emissions (lb/day)
Light Duty	0.9052149	0.18
Medium Duty	1.2907494	0.00
Heavy Duty	2.0273082	3.65
Heavy Heavy Duty	2.2006518	25.31
Uncontrolled Total		29.14
Controlled Total[2]		11.36

(1) Based on Section 13.2.2 of EPA's Compilation of Air Pollutant Emission Factors (AP-42).
Emission Rate = 1.5((s/12)^.9)*((W/3)^.45)
s = silt content = 7.5%
W = Vehicle Weight (ton) =2.5 for light, 5.5 for medium, 15 for heavy, and 18 for heavy heavy (EMFAC2007).

(2) Controlled Emissions assume that watering 3 times per day reduces emissions by 61 percent (Uncontrolled Emissions x 0.39)

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Paint Emissions

Activity	Year 1							Year 2										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Volume paint applied per day (gal)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	0.0	0.0	75.0	75.0
VOC content (lb/gal)[(1)]	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
VOC Emissions (lb/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	16.6	0.0	0.0	0.0	62.3	62.3

(1) Based on SCAQMD Rule 1113 VOC limit of 100g/L for industrial maintenance coatings.

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
Peak Daily Fugitive PM Construction Emissions

Grading Operations	Average Pieces of Equipment Operating	Peak Pieces of Equipment Operating	Hours of Operation	PM10 Emission Factor (lb/hour)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions (lbs/day)	Controlled Emissions: Peak PM10 Emissions (lbs/day)	Uncontrolled Emissions: Average PM10 Emissions (lbs/day)	Uncontrolled Emissions: Peak PM10 Emissions (lbs/day)	SCAQMD Emission Factor Source
Construction Activities[1]	6	6	10	0.348	0.39	8.13	8.13	20.8581913	20.8581913	Table A9-9-F

Stockpiles	Average Tons of Materials Handled Per Day	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions Pounds/day	Controlled Emissions: Peak PM10 Emissions Pounds/day	Uncontrolled Emissions: Average PM10 Emissions Pounds/day	Uncontrolled Emissions: Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Construction Activities[2]	1000	1000	0.00005	0.39	0.02009809	0.02009809	0.05153357	0.05153357	Table A9-9-G

Assumptions: 1cubic yard trench spoils = 1 ton

WIND EROSION Disturbed Area and Temporary Stockpiles	Days of Construction	Average Acreage Disturbed Per Day	Peak Acreage Disturbed Per Day	PM10 Emission Factor (lb/day/acre)	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Tons/Year	Peak PM10 Emissions Tons/Year	SCAQMD Emission Factor Source
Construction Activities[3]	20	0.25	0.25	0.120	0.030	0.030	0.000	0.000	Table A9-9-E

Filling and Dumping	Estimated Materials Handled Per Day (tons)	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions Pounds/day	Controlled Emissions: Peak PM10 Emissions Pounds/day	Uncontrolled Emissions: Average PM10 Emissions Pounds/day	Uncontrolled Emissions: Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Truck Filling[4]	1000.0	1000.0	0.02205	0.39	8.5995	8.5995	22.05	22.05	Table A9-9
Truck Dumping	1000.0	1000.0	0.009075	0.39	3.53925	3.53925	9.075	9.075	Table A9-9

TOTAL PM10 Pounds/day	Average	Peak
(Controlled Emissions)	20.3235	20.32347
(Uncontrolled Emissions)	52.035	52.035

(1) Emissions (lbs/hr) = [0.75 x $(G^{1.5})/(H^{1.4})$ x J
where G = silt content (7.5%), H = moisture content (15.0%) and J = hrs of operation (EPA AP-42 Table 11.9-1 for bulldozing overburden).

(2) Emissions (lbs/ton) = 0.00112 x $[(G/5)^{1.3}/(H/2)^{1.4}]$ x I/J
where G=mean wind speed (4.1 mph), H=moisture content of surface material (15%); I=lbs of dirt handled per day; and J=2,000 lbs/ton. Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.

(3) Emissions (lbs/day/acre) = 1.7 x [(G/1.5)*(365-H)/235] x I/15 x J
where G = silt content (7.5%); H = days with >0.01 inch of rain (34); I = percentage of time wind speed exceeds 12 mph (0.3%) and J= fraction of TSP (0.5). Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.

(4) Used SCAQMD Table 9-9 Default emission factors.

(5) Mitigated Emissions assume that watering 3 times per day controls emissions by 61 percent (Uncontrolled Emissions x 0.39). www.AQMD.gov/CEQA/handbook/mitigation/fugitive/Table XI-A.doc

Appendix A
Phillips 66 Carson Plant
Crude Oil Storage Capacity Project
LST Analysis for Construction Emissions

	On-site Source Emissions (lbs/day)					
	CO	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
Peak Construction Emissions	55.64		83.06		46.56	20.15
Screening Value[(1)(2)]	**7,558**	**NA**	**142**	**NA**	**158**	**93**
Significant?	**NO**	**-**	**NO**	**-**	**NO**	**NO**

(1) Screening values for LST analysis from SCAQMD Final Localized Significance Threshold Methodology, Appendix C (October 2009).

(2) 1 acre site located in SRA No. 4 at 500 meters.

Appendix A
Phillips 66 Carson Plant
Increase Crude Capacity Project
Peak Operational VOC Emissions

Sources	VOC (lb/day)[1]
Existing Tank 510 Emissions[2]	7.52
Existing Tank 511 Emissions[2]	9.22
Total Baseline Emissions	**16.74**
Modified Tank 510 Crude Tank	17.04
Modified Tank 511 Crude Tank	17.04
New Tank 2640 Crude Tank[3]	19.54
New Tank 2643 Crude Tank[3]	4.27
New Fugitive Emissions	9.67
Total Proposed Project Emissions	**67.57**
Net Emissions	**50.83**
Significance Threshold	**55.00**
Significant?	**NO**

(1) Peak daily emissions based on peak month in TANKS 4.0 models for each tank.

(2) Based on TANKS 4.0 model with 2010 throughputs.

(3) Tank leg emissions scaled for 4" legs.

Appendix A
Phillips 66 Carson Plant
Increase Crude Capacity Project
Operational GHG Emissions

GHG from Electrical Demand		
Electrical Demand	25	kW
Hours of Operation	8760	per year
Total Electrical Demand	219	MWh/yr
CO2e Emission Factor	634.6	lbs/MWh
Total CO2e Emissions	*63*	*tonnes/yr*
GHG from Construction		
Total Construction GHG	1264	tonnes
30-yr Ammortized GHG	*43*	*tonnes/yr*
Total Operational GHG	**106**	**tonnes/yr**

Appendix A
Phillips 66 Carson Plant
Increase Crude Capacity Project
Fugitive VOC Emissions

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2640**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	190	0.00	0	-
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	14	4.55	0	63.64
		Light Liquid (4)	0	0	83	4.55	0	377.30
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	5	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	2	46.83	0	93.65
Compressors		Gas / Vapor	0	0		9.09	-	-
Flanges (ANSI 16.5-1988)		All	0	0	258	6.99	-	1,803.47
Connectors		All	0	0	134	2.86	-	383.43
Pressure Relief Valves		All	0	0	6	9.09	0	54.54
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	-
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	7	9.09	-	63.63
Total Emissions		lb/year					-	2,840
		lbs/day					0	7.78

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Appendix A
Phillips 66 Carson Plant
Increase Crude Capacity Project
Fugitive VOC Emissions

Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2643**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	61	0.00	0	-
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	0	4.55	0	-
		Light Liquid (4)	0	0	16	4.55	0	72.73
		Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 inches	0	0	0		0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	-
Compressors		Gas / Vapor	0	0	0	9.09	-	-
Flanges (ANSI 16.5-1988)		All	0	0	79	6.99	-	552.22
Connectors		All	0	0	20	2.86	-	57.23
Pressure Relief Valves		All	0	0	0	9.09	0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	-
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	1	9.09	-	9.09
Total Emissions		lb/year					-	691
		lbs/day					0	1.89

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	R510/511
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	285000 bbl tank (working capacity)

Tank Dimensions

Diameter (ft):	218.60
Volume (gallons):	11,970,000.00
Turnovers:	63.16

Paint Characteristics

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

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Shoe-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4710	N/A	N/A	49.6789	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0096	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6203	N/A	N/A	49.6754	0.9611	0.9845	215.40	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7740	N/A	N/A	49.6718	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777

Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0738	N/A	N/A	49.6648	0.9611	0.9840	215.40	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0096	0.0095	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3236	N/A	N/A	49.6591	0.9611	0.9838	215.40	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0096	0.0097	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5998	N/A	N/A	49.6528	0.9611	0.9835	215.40	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9781	N/A	N/A	49.6443	0.9611	0.9831	215.40	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0361	N/A	N/A	49.6430	0.9611	0.9830	215.40	

Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0096	0.0098	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7956	N/A	N/A	49.6484	0.9611	0.9832	215.40	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0096	0.0096	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4019	N/A	N/A	49.6573	0.9611	0.9837	215.40	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8556	N/A	N/A	49.6699	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4674	N/A	N/A	49.6790	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d

Emissions Report - Detail Format

Detail Calculations (AP-42)

R510/511 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	129.3637	132.6208	136.0466	142.9539	148.9552	155.8714	165.8725	167.4663	160.9664	150.8849	137.8970	129.2861
Seal Factor A (lb-mole/ft-yr):	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000	1.6000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528	275.6528
Net Throughput (gal/mo.):	63,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.000063,000,000.0000											
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000	218.6000
Roof Fitting Losses (lb):	66.0133	67.6754	69.4236	72.9483	76.0107	79.5401	84.6435	85.4569	82.1400	76.9955	70.3678	65.9738
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800	178.4800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	471.0298	475.9490	481.1230	491.5550	500.6187	511.0643	526.1688	528.5760	518.7592	503.5332	483.9176	470.9127

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	222.3109
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	62.3678
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77	0.53	0.11	0.13	205.2603
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	28.1661
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	70.4152

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

R510/511 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	1,758.18	3,307.83	897.19	0.00	5,963.21
1,2,4-Trimethylbenzene	0.06	9.30	0.03	0.00	9.39
Benzene	1.51	4.68	0.77	0.00	6.96
Chrysene	0.00	0.07	0.00	0.00	0.07
Cresol (-m)	0.00	0.02	0.00	0.00	0.02
Cumene	0.00	0.08	0.00	0.00	0.08
Cyclohexene	7.43	24.48	3.79	0.00	35.69
Ethylbenzene	0.16	4.94	0.08	0.00	5.17
Hexane (-n)	16.65	31.76	8.50	0.00	56.90
Naphthalene	0.00	3.03	0.00	0.00	3.03
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	1.79	19.09	0.91	0.00	21.79
Unidentified Components	1,729.77	3,179.16	882.69	0.00	5,791.61
Xylenes (mixed isomers)	0.82	31.23	0.42	0.00	32.47

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legged2
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,005,922.00
Turnovers:	59.98

Paint Characteristics

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

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Roof Drain (3-in. Diameter)/90% Closed	3

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

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

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4710	N/A	N/A	49.6789	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0096	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6203	N/A	N/A	49.6754	0.9611	0.9845	215.40	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7740	N/A	N/A	49.6718	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0738	N/A	N/A	49.6648	0.9611	0.9840	215.40	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0096	0.0095	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3236	N/A	N/A	49.6591	0.9611	0.9838	215.40	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0096	0.0097	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5998	N/A	N/A	49.6528	0.9611	0.9835	215.40	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9781	N/A	N/A	49.6443	0.9611	0.9831	215.40	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0361	N/A	N/A	49.6430	0.9611	0.9830	215.40	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0096	0.0098	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7956	N/A	N/A	49.6484	0.9611	0.9832	215.40	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0096	0.0096	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4019	N/A	N/A	49.6573	0.9611	0.9837	215.40	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8556	N/A	N/A	49.6699	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4674	N/A	N/A	49.6790	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	75.1897	77.0828	79.0740	83.0887	86.5768	90.5967	96.4096	97.3360	93.5581	87.6984	80.1495	75.1446
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900	203.2900
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	519.1558	522.5016	526.0208	533.1163	539.2811	546.3858	556.6594	558.2967	551.6196	541.2634	527.9216	519.0761

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	155.9194
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134	0.53	0.11	0.13	357.2063
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	222.3109
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	27.1602

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legged2 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	1,021.90	0.00	6,441.30
1,2,4-Trimethylbenzene	0.03	13.04	0.03	0.00	13.09
Benzene	0.68	6.55	0.88	0.00	8.11
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	4.32	0.00	41.93
Ethylbenzene	0.07	6.92	0.09	0.00	7.08
Hexane (-n)	7.43	44.50	9.68	0.00	61.60
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	1.04	0.00	28.59
Unidentified Components	771.51	4,454.89	1,005.39	0.00	6,231.79
Xylenes (mixed isomers)	0.37	43.76	0.48	0.00	44.61

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2640 legless2
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	500000 bbl domed tank (working capacity)

Tank Dimensions

Diameter (ft):	260.00
Volume (gallons):	21,005,922.00
Turnovers:	59.98

Paint Characteristics

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

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Drain (3-in. Diameter)/90% Closed	3

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

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

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4710	N/A	N/A	49.6789	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0096	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6203	N/A	N/A	49.6754	0.9611	0.9845	215.40	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7740	N/A	N/A	49.6718	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0738	N/A	N/A	49.6648	0.9611	0.9840	215.40	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0096	0.0095	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3236	N/A	N/A	49.6591	0.9611	0.9838	215.40	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0096	0.0097	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5998	N/A	N/A	49.6528	0.9611	0.9835	215.40	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9781	N/A	N/A	49.6443	0.9611	0.9831	215.40	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0361	N/A	N/A	49.6430	0.9611	0.9830	215.40	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0096	0.0098	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7956	N/A	N/A	49.6484	0.9611	0.9832	215.40	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0096	0.0096	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4019	N/A	N/A	49.6573	0.9611	0.9837	215.40	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8556	N/A	N/A	49.6699	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4674	N/A	N/A	49.6790	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	57.6988	59.1515	60.6795	63.7603	66.4370	69.5218	73.9825	74.6934	71.7943	67.2977	61.5048	57.6642
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673	386.2673
Net Throughput (gal/mo.):	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000	105,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000	260.0000
Roof Fitting Losses (lb):	32.5739	33.3941	34.2567	35.9960	37.5071	39.2486	41.7669	42.1682	40.5315	37.9930	34.7226	32.5544
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700	88.0700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	476.5400	478.8129	481.2036	486.0236	490.2114	495.0377	502.0167	503.1289	498.5931	491.5580	482.4948	476.4859

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	155.9194
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	32.1898
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	27.1602

TANKS 4.0.9d
Emissions Report - Detail Format

Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2640 legless2 - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	784.19	4,635.21	442.71	0.00	5,862.11
1,2,4-Trimethylbenzene	0.03	13.04	0.01	0.00	13.08
Benzene	0.68	6.55	0.38	0.00	7.61
Chrysene	0.00	0.09	0.00	0.00	0.09
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
Cumene	0.00	0.11	0.00	0.00	0.12
Cyclohexene	3.31	34.30	1.87	0.00	39.48
Ethylbenzene	0.07	6.92	0.04	0.00	7.03
Hexane (-n)	7.43	44.50	4.19	0.00	56.12
Naphthalene	0.00	4.24	0.00	0.00	4.24
Phenol	0.00	0.01	0.00	0.00	0.01
Toluene	0.80	26.76	0.45	0.00	28.00
Unidentified Components	771.51	4,454.89	435.56	0.00	5,661.96
Xylenes (mixed isomers)	0.37	43.76	0.21	0.00	44.34

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2643 legged
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	44.00
Volume (gallons):	421,470.00
Turnovers:	76.53

Paint Characteristics

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

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12
Roof Drain (3-in. Diameter)/90% Closed	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

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

2643 legged - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4710	N/A	N/A	49.6789	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0096	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6203	N/A	N/A	49.6754	0.9611	0.9845	215.40	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7740	N/A	N/A	49.6718	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0738	N/A	N/A	49.6648	0.9611	0.9840	215.40	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0096	0.0095	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3236	N/A	N/A	49.6591	0.9611	0.9838	215.40	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0096	0.0097	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5998	N/A	N/A	49.6528	0.9611	0.9835	215.40	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9781	N/A	N/A	49.6443	0.9611	0.9831	215.40	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0361	N/A	N/A	49.6430	0.9611	0.9830	215.40	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0096	0.0098	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7956	N/A	N/A	49.6484	0.9611	0.9832	215.40	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0096	0.0096	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4019	N/A	N/A	49.6573	0.9611	0.9837	215.40	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8556	N/A	N/A	49.6699	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4674	N/A	N/A	49.6790	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 legged - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	9.7644	10.0103	10.2688	10.7902	11.2432	11.7652	12.5201	12.6404	12.1498	11.3888	10.4085	9.7586
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Roof Fitting Losses (lb):	45.2381	46.3771	47.5751	49.9905	52.0892	54.5078	58.0051	58.5625	56.2895	52.7640	48.2222	45.2110
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100	122.3100
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	113.4342	114.8190	116.2756	119.2124	121.7641	124.7047	128.9569	129.6346	126.8710	122.5845	117.0624	113.4012

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	31.1839
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12	0.82	0.53	0.14	49.4918
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2643 legged - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	132.71	701.18	614.83	0.00	1,448.72
1,2,4-Trimethylbenzene	0.00	1.97	0.02	0.00	2.00
Benzene	0.11	0.99	0.53	0.00	1.64
Chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.56	5.19	2.60	0.00	8.35
Ethylbenzene	0.01	1.05	0.05	0.00	1.11
Hexane (-n)	1.26	6.73	5.82	0.00	13.81
Naphthalene	0.00	0.64	0.00	0.00	0.64
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.05	0.63	0.00	4.81
Unidentified Components	130.56	673.90	604.89	0.00	1,409.36
Xylenes (mixed isomers)	0.06	6.62	0.29	0.00	6.97

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	2643 legless
City:	Long Beach
State:	California
Company:	
Type of Tank:	Domed External Floating Roof Tank
Description:	10000bbl (working capacity) domed water surge tank

Tank Dimensions

Diameter (ft):	44.00
Volume (gallons):	421,470.00
Turnovers:	76.53

Paint Characteristics

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

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

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

2643 legless - Domed External Floating Roof Tank
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude Oil (RVP11)	Jan	61.79	56.79	66.79	64.33	8.7413	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2270	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1519	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1155	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0042	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3490	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4710	N/A	N/A	49.6789	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0962	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Feb	62.78	57.67	67.88	64.33	8.8800	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0228	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2607	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0016	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0533	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1832	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1195	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0558	N/A	N/A	86.1700	0.0096	0.0091	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0028	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0032	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3597	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6203	N/A	N/A	49.6754	0.9611	0.9845	215.40	
Xylenes (mixed isomers)						0.0996	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Mar	63.78	58.57	68.99	64.33	9.0228	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2957	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0553	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2157	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1236	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1093	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0029	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0034	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3710	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7740	N/A	N/A	49.6718	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1031	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Apr	65.70	59.89	71.51	64.33	9.3013	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

Benzene						1.3652	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0594	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2800	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1320	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2152	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0032	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0038	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3934	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.0738	N/A	N/A	49.6648	0.9611	0.9840	215.40	
Xylenes (mixed isomers)						0.1101	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	May	67.27	61.79	72.76	64.33	9.5335	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0272	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4241	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0020	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0629	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3346	N/A	N/A	82.1500	0.0074	0.0042	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1392	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3049	N/A	N/A	86.1700	0.0096	0.0095	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0034	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0041	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4125	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3236	N/A	N/A	49.6591	0.9611	0.9838	215.40	
Xylenes (mixed isomers)						0.1162	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jun	68.98	63.35	74.61	64.33	9.7902	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0291	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4904	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0022	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0668	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3960	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1474	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4054	N/A	N/A	86.1700	0.0096	0.0097	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0037	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0045	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4341	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.5998	N/A	N/A	49.6528	0.9611	0.9835	215.40	
Xylenes (mixed isomers)						0.1231	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Jul	71.26	65.04	77.47	64.33	10.1419	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0317	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5831	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0725	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4817	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1589	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5456	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0040	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0050	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4645	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.9781	N/A	N/A	49.6443	0.9611	0.9831	215.40	
Xylenes (mixed isomers)						0.1329	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Aug	71.60	65.63	77.58	64.33	10.1959	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5975	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0025	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0734	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4951	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5674	N/A	N/A	86.1700	0.0096	0.0099	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Naphthalene						0.0041	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0051	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4693	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.0361	N/A	N/A	49.6430	0.9611	0.9830	215.40	
Xylenes (mixed isomers)						0.1344	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Sep	70.17	64.65	75.68	64.33	9.9722	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0304	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5381	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0023	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0697	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.4401	N/A	N/A	82.1500	0.0074	0.0044	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1533	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4776	N/A	N/A	86.1700	0.0096	0.0098	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0039	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0048	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4497	N/A	N/A	92.1300	0.0058	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.7956	N/A	N/A	49.6484	0.9611	0.9832	215.40	
Xylenes (mixed isomers)						0.1281	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Oct	67.76	62.48	73.04	64.33	9.6062	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0277	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4428	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0021	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0640	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.3519	N/A	N/A	82.1500	0.0074	0.0043	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1415	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3332	N/A	N/A	86.1700	0.0096	0.0096	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0035	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0042	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.4186	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4019	N/A	N/A	49.6573	0.9611	0.9837	215.40	
Xylenes (mixed isomers)						0.1181	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Nov	64.31	59.22	69.40	64.33	9.0986	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0242	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3145	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0017	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0564	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.2330	N/A	N/A	82.1500	0.0074	0.0041	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1259	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1380	N/A	N/A	86.1700	0.0096	0.0092	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0030	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0035	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3770	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.8556	N/A	N/A	49.6699	0.9611	0.9843	215.40	
Xylenes (mixed isomers)						0.1050	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Crude Oil (RVP11)	Dec	61.76	56.83	66.70	64.33	8.7379	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0219	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2262	N/A	N/A	78.1100	0.0014	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0015	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cumene						0.0514	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=6.93666, B=1460.793, C=207.777
Cyclohexene						1.1512	N/A	N/A	82.1500	0.0074	0.0040	82.15	Option 2: A=6.8861, B=1229.973, C=224.1
Ethylbenzene						0.1154	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0030	N/A	N/A	86.1700	0.0096	0.0090	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Naphthalene						0.0027	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Phenol						0.0031	N/A	N/A	94.1112	0.0000	0.0000	94.11	Option 2: A=7.1345, B=1516.07, C=174.57
Toluene						0.3487	N/A	N/A	92.1300	0.0058	0.0009	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.4674	N/A	N/A	49.6790	0.9611	0.9847	215.40	
Xylenes (mixed isomers)						0.0961	N/A	N/A	106.1700	0.0094	0.0004	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 legless - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	9.7644	10.0103	10.2688	10.7902	11.2432	11.7652	12.5201	12.6404	12.1498	11.3888	10.4085	9.7586
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7413	8.8800	9.0228	9.3013	9.5335	9.7902	10.1419	10.1959	9.9722	9.6062	9.0986	8.7379
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317	58.4317
Net Throughput (gal/mo.):	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000	2,688,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000	44.0000
Roof Fitting Losses (lb):	41.5986	42.6460	43.7476	45.9687	47.8985	50.1225	53.3385	53.8510	51.7609	48.5191	44.3426	41.5737
Value of Vapor Pressure Function:	0.2219	0.2275	0.2334	0.2452	0.2555	0.2674	0.2845	0.2873	0.2761	0.2588	0.2366	0.2218
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700	112.4700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	109.7947	111.0879	112.4482	115.1906	117.5734	120.3195	124.2903	124.9232	122.3424	118.3396	113.1828	109.7639

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	16.0949
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	14.0830
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	31.1839
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	211.2456
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3639
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	9.0534
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	281.6608

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

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

2643 legless - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude Oil (RVP11)	132.71	701.18	565.37	0.00	1,399.26
1,2,4-Trimethylbenzene	0.00	1.97	0.02	0.00	1.99
Benzene	0.11	0.99	0.49	0.00	1.59
Chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Cumene	0.00	0.02	0.00	0.00	0.02
Cyclohexene	0.56	5.19	2.39	0.00	8.14
Ethylbenzene	0.01	1.05	0.05	0.00	1.11
Hexane (-n)	1.26	6.73	5.35	0.00	13.34
Naphthalene	0.00	0.64	0.00	0.00	0.64
Phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.05	0.57	0.00	4.76
Unidentified Components	130.56	673.90	556.23	0.00	1,360.70
Xylenes (mixed isomers)	0.06	6.62	0.26	0.00	6.95

Estimation of VOC Emissions from Excavating Contaminated Soil During LARC Crude Storage Capacity Project Construction

Equations for estimating emissions from contaminated soil are provided in DTSC's Preliminary Endangerment Assessment (PEA) Guidance Manual. The Equations are based on the Jury Model evaluated by USEPA. Emissions are estimated based on chemical concentrations in soil and physical properties of those chemicals.

The chemical concentrations were estimated based on methods established by the Total Petroleum Hydrocarbon (TPH) Work Group. The actual volatile organic chemicals (VOCs) in the soil are a complex mixture of various hydrocarbons. The concentrations of total petroleum hydrocarbons present in the soil were analyzed by USEPA Test Method 8015. Results were reported in terms of gasoline and diesel range organic compounds. Results for samples at the estimated depth of the elevation (38 feet above mean sea level) are listed in the attached Table 1. The highest gasoline result reported (640 mg/kg) was in the location of Soil Boring (SB) 19 at a depth of 4' below existing grade. The highest diesel result reported (14000 mg/kg) was in the location of Soil Boring (SB) 26 at a depth of 4' below existing grade.

In accordance with practices developed by the TPH Work Group, surrogate hydrocarbons were used to simulate the physical properties of the detected hydrocarbons. Based on the retention times of the detected hydrocarbons, surrogate compounds were assigned based on the ranges shown in Table 2. Physical properties for the surrogate compounds used for estimating the emission rates were taken from a Utah, Department of Environmental Quality publication "Guidelines for Fractionation at Leaking Underground Storage Tank Sites" (see Attachment 1) Surrogate concentrations estimated from the maximum detected levels from Table 1 are summarized in Table 3.

Emissions for each surrogate compound were calculated based on the Total Emission Rate calculations in Appendix A of the PEA Guidance Manual (see Attachment 2). The exposure area was taken as the size of the excavation at its greatest extent (60,000 square feet). Instead of the six years that is usually used to estimate emission rates for noncarcinogenic risk assessments, the exposure time was taken as one day to maximize the estimated daily emission rates. Values for Soil Bulk Density, Particle Density and Soil Moisture were obtained from the geotechnical data collected for the tank foundation design.

The estimates of emissions are summarized in Table 4. The total peak daily estimated VOC emissions are 3.26 pounds per day.

TABLES

TABLE 1. TOTAL PETROLEUM HYDROCARBON RESULTS
LARC RESERVOIR 1

Sample ID	Lab Report ID	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Total TPH (mg/kg)
SB-16 @ 5'	12-09-1278	140	**9300**	**9440**
SB-17 @ 4'	12-09-1439	0.08	770	770.08
SB-18 @ 4'	12-09-1439	0.52	**5300**	**5300.52**
SB-19 @ 4'	12-09-1439	2.3	**14000**	**14002.3**
SB-20 @ 4'	12-09-1439	0.69	**1800**	**1800.69**
SB-21 @ 4'	12-09-1439	3.8	**8800**	**8803.8**
SB-22 @ 4'	12-09-1439	*	**7900**	**7900**
B-23 @ 4'	12-09-1490	240	**4200**	**4440**
B-24 @ 4'	12-09-1490	0	**3800**	**3800**
B-25 @ 4'	12-09-1490	*	**2600**	**2600**
B-26 @ 4'	12-09-1490	640	**7900**	**8540**
SB-27 @ 4'	12-09-1531	99	**2700**	**2799**
B-29 @ 4'	12-09-1490	610	**10000**	**10610**
B-30 @ 4'	12-09-1490	1	9	10

Limits			
Minimum	0.08	9.4	10.27
Maximum	640	14000	14002.3
Average	144.79	5648.53	5772.63

Notes:

* - not detected at or above reporting limit.

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

INS - insufficient material to run test

Class III Landfills: <1000 mg/kg GRO, <3000 mg/kg DRO, <3000 mg/kg MRO

Table 2: Retention Times for Speciation

Carbon Ranges	TPH (Diesel) Peaks Low	TPH (Diesel) Peaks High	TPH (Gasoline) Peaks Low	TPH (Gasoline) Peaks High
	(minutes)	(minutes)	(minutes)	(minutes)
C5-C6	0	0.233	1.402	2.859
C7-C8	0.234	0.694	2.86	5.395
C9-C10	0.695	1.223	5.396	13.558
C11-C12	1.224	1.696	13.559	22.736
C13-C16	1.697	2.494	NA	NA
C17-C21	2.495	3.297	NA	NA
C22-C35	3.298	4.96	NA	NA

Table 3: Surrogate Concentrations

SB26@4'	Areas	mg/kg	
Gasoline	17181208	640	TPH
C5-C6	40141	1	Hexane
C7-C8	80112	3	Heptane
C9-C10	844770	31	Nonane
C11-C12	7006698	261	Undecane
Subtotal	7971721	297	
C13+	8280452	343	Hexadecane
SB19@4'	Areas	mg/kg	
Diesel	5523.09	14000	TPH
C5-C6	0.00	0	
C7-C8	0.00	0	
C9-C10	8.68	22	Nonane
C11-C12	61.23	155	Undecane
C13-C16	373.13	946	Hexadecane
C17-C21	845.84	2144	Heptadecane
C22-C35	2359.52	5981	Heptadecane
Subtotal	3648.40	9248	
C35+	1624.35	4117	Nonvolatile

Table 4: Calculation of Maximum Daily VOC Emissions

	Bulk Density	Particle Density	Moisture
#/ft3	128	160	15.36
g/cm3	2.05	2.57	0.25
Pt	0.2		
Pa	0.075		
Pa3.33/Pt2	0.00449		
A	55741824	cm2	
T	86400	sec.	

Carbon Range	Surrogate Compound	Hc	Kd	Kas	Dei	α
		unitless	l/kg	g/ml	cm2/sec	
C5-C6	Hexane	41	12.6	3.253968	0.000384	3.585E-05
C7-C8	Heptane	48	63.2	0.759494	0.0003	7.035E-06
C9-C10	Nonane	5	632	0.007911	0.000289	7.222E-08
C11-C12	Undecane	0.48	6320	7.59E-05	0.000206	4.953E-10
C13-C16	Hexadecane	0.036	100000	3.6E-07	0.000177	2.016E-12
C17-C21	Heptadecane	8.40E-04	8000000	1.05E-10	0.000147	4.883E-16
C22-C35	Heptadecane	8.40E-04	8000000	1.05E-10	0.000147	4.883E-16

E/C(mg/kg)	Gasoline from SB26@4'	Diesel from SB19@4'	Worst Case	E mg/sec
	mg/kg	mg/kg		
3.35E-03	1	0	1	5.02E-03
1.38E-03	3	0	3	4.12E-03
1.37E-04	31	22	31	4.30E-03
1.13E-05	261	155	261	2.95E-03
7.21E-07	343	946	946	6.82E-04
1.12E-08	0	2144	2144	2.41E-05
1.12E-08	0	5981	5981	6.71E-05

Total Daily VOC Emissions 1.72E-02 mg/sec

3.26 #/day

ATTACHMENTS

Table 2: TPH Fraction-Specific [a] and Chemical-Specific Property [a] and Toxicity Values

TPH Fractions and Chemicals showing Carbon Number and Representative CAS number	EPA Analytical Method[b]	Molecular weight (g/mol)	Vapor Pressure[c] (mm Hg)	Henry's Law Constant[d] (L-H_2O/L-air, unitless)	Diffusion Coefficient in Air [e] (D^{air}, cm^2/s)	Diffusion Coefficient in Water [e] (D^w, cm^2/s)	Aqueous Solubility (20-25° C) (pure compound) (mg/L)	Adsorption Coefficient (Koc) (mL/g)	Cancer Slope Factor, Oral (SF_o) (kg-day/mg)	Cancer Slope Factor, Inhalation (SF_i) (kg-day/mg)	Reference Dose, Oral (RfD_o) (mg/kg-day)	Reference Dose, Inhalation (RfD_i) (mg/kg-day)
ALIPHATICS												
C_5-C_6 110-54-3 (hexane)	8260B	81	2.66 E+02 [g]	4.10 E+01	8.57 E-02	8.34 E-06	3.60 E+01	6.30 E+02	-	-	6.00 E-02 [h]	6.00 E-02 [h]
C_7-C_8 142-82-5 (heptane)	8260B	100	4.80 E+01	7.70 E+01	6.69 E-02	6.89 E-06	5.40 E+00	3.16 E+03	-	-	6.00 E-02 [h]	6.00 E-02 [h]
C_9-C_{10} 111-84-2 (nonane)	8260B	130	5.00 E+00	1.60 E+02	6.44 E-02	5.90 E-06	4.30 E-01	3.16 E+04	-	-	1.00 E-01 [i]	2.90 E-01 [i]
C_{11}-C_{12} 1120-21-4 (undecane)	8270B	160	4.80 E-01	1.60 E+02	4.60 E-02	5.19 E-06	3.40 E-02	3.16 E+05	-	-	1.00 E-01 [i]	2.90 E-01 [i]
C_{13}-C_{16} 544-76-3 (hexadecane)	8270B	200	3.60 E-02	1.60 E+02	3.95 E-02	4.50 E-06	7.60 E-04	5.00 E+06	-	-	1.00 E-01 [i]	2.90 E-01 [i]
C_{17}-C_{21} 544-76-3 (heptadecane)	8270B	270	8.40 E-04	1.10 E+02	3.28 E-02	3.76 E-06	2.50 E-06	4.00 E+08	-	-	2.00 E+00 [i]	na [i]
C22-C35 629-78-7 (heptadecane)	8270B	280	8.40 E-04	1.10 E+02	3.28 E-02	3.76 E-06	1.50 E-06	4.00 E+08	-	-	2.00 E+00 i	na i

Source: Utah Department of Environmental Quality - Guidelines for TPH Fractionation at Leaking Underground Storage Tank Sites, 2012 - http://www.undergroundtanks.utah.gov/docs/fractionation.pdf (accessed July 10, 2013)

For contaminants which do not fit into either of the classes listed above, use this third equation, which is based primarily on pesticides:

$$K_{oc} = 10^{((0.544 \log K_{ow}) + 1.377)}$$

Where:

K_{oc} = organic carbon partition coefficient, L/kg (mL/g)

K_{ow} = octanol/water partition coefficient, L/kg (Ml/g)

Step 2: Calculate the Total Emission Rate

If bulk soil concentrations do not exceed C_{sat}, then calculate an emission rate for each contaminant using the equation below. This equation assumes the bulk soil concentration of the contaminant is less than the saturation concentration, C_{sat}. The default values are the same as those stated in EPA (1991b), except for the area of contamination, (A), the fraction of organic carbon in the soil (f_{oc}), and the exposure interval (T). The default value for the exposed surface area is equal to 5,000 square feet (4.84×10^6 cm^2 or 484 m^2), the minimum dimensions of a residential lot in California (Hadley and Sedman, 1990). The default value for soil organic carbon is 0.02 (1992b). The default values for exposure interval are 30 yr for carcinogenic risk and 6 yr for non-carcinogenic hazard.

$$E = \frac{2\, A\, D_{ei}\, P_a\ K_{as}\, C_i \times 10^3\ mg/g}{\sqrt{\pi\, \alpha\, T}}$$

Where:

E_i = average emission rate of contaminant i over the residential lot during the exposure interval, mg/sec

A = area of contamination, cm^2; default = $4.84 \times 10^{+6}$ cm^2,

D_{ei} = effective diffusivity of compound, cm^2/sec
= $D_i (P_a^{3.33}/P_t^2)$

Where:

D_i = diffusivity in air, cm^2/s.
(Values are shown in Appendix C, Table 4. If the desired value is not found in Table 4, refer to USEPA (1992b), equation (9), page 13.)

P_t = total soil porosity, unitless
= 1-(ß/ρ)

Where:

ß = soil bulk density, g/cm^3 (default = 1.5 g/cm^3)

ρ = particle density, g/cm^3 (default = 2.65 g/cm^3)

P_t = 0.434

P_a = air filled soil porosity, unitless
= $P_t - \Theta_m$ ß

Where:

Θ_m = soil moisture content, cm^3/g (default = 0.1 cm^3/g)

P_a = 0.284

K_{as} = soil/air partition coefficient, g/cm^3
= $(H_c/K_d) \times 41$

Where:

H_c = Henry's Law constant, atm-m^3/mole

41 = conversion factor to change H_c to dimensionless form

K_d = soil-water partition coefficient (cm^3-water/g-soil)
(= L/kg)

C_i = bulk soil concentration of contaminant i, g/g-soil

T = exposure interval, sec (default = 30 yr = 9.5 x 10^8 seconds)

α = conversion factor composed of quantities defined above

$$\alpha = \frac{D_{ei} \times P_a}{P_a + [(\rho)(1 - P_a)/K_{as}]}$$

LAB RESULTS

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

TriHydro Corporation		Date Received:	09/24/12
2501 Cherry Street, Suite 200		Work Order No:	12-09-1439
Signal Hill, CA 90755-2070		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)

Project: LARC Soil Characterization Analysis 436-087-001

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-19@4'	**12-09-1439-9-A**	**09/21/12 09:56**	**Solid**	**GC 45**	**09/26/12**	**09/27/12 19:02**	**120926B03**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	14000	100	31	20	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
n-Octacosane	99	61-145	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-19@8'	**12-09-1439-10-A**	**09/21/12 10:06**	**Solid**	**GC 45**	**09/26/12**	**09/27/12 19:17**	**120926B03**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	12000	100	31	20	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
n-Octacosane	103	61-145	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-19@12'	**12-09-1439-11-A**	**09/21/12 10:22**	**Solid**	**GC 45**	**09/26/12**	**09/27/12 19:48**	**120926B03**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	65000	500	160	100	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
n-Octacosane	119	61-145	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-19@16'	**12-09-1439-12-A**	**09/21/12 10:27**	**Solid**	**GC 45**	**09/26/12**	**09/27/12 20:03**	**120926B03**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Diesel	42000	250	78	50	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
n-Octacosane	117	61-145	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

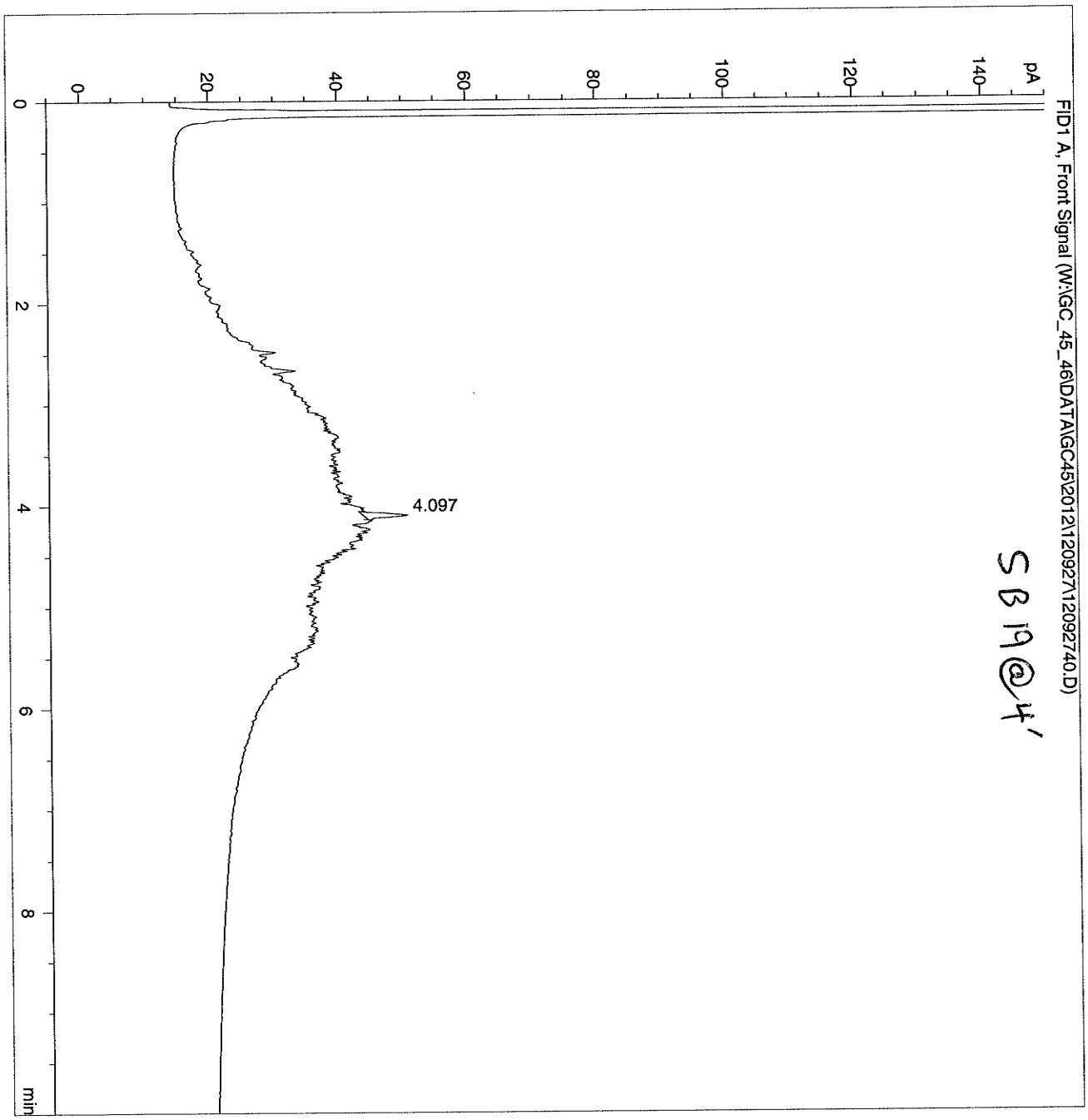
Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 2
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:18 pm

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Analysis Method : 8015B.MTH



Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 1
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH

Sig. 1 in W:\GC_45_46\DATA\GC45\2012\120927->

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	0.701	0.06	0	MV	0.019	0.001
2	0.799	0.56	0	VV	0.056	0.010
3	0.850	0.29	0	VV	0.037	0.005
4	0.885	0.20	0	VV	0.028	0.004
5	0.936	0.42	0	VV	0.044	0.008
6	0.989	0.62	0	VV	0.036	0.011
7	1.029	0.89	0	VV	0.036	0.016
8	1.116	2.42	1	VV	0.065	0.044
9	1.161	1.04	1	VV	0.032	0.019
10	1.207	2.18	1	VV	0.043	0.039
11	1.247	2.90	1	VV	0.041	0.053
12	1.380	9.72	2	VV	0.085	0.176
13	1.453	5.04	2	VV	0.042	0.091
14	1.480	9.16	3	VV	0.050	0.166
15	1.571	15.54	4	VV	0.070	0.281
16	1.611	18.87	4	VV	0.074	0.342
17	1.699	12.12	4	VV	0.051	0.219
18	1.745	11.61	4	VV	0.045	0.210
19	1.847	31.69	6	VV	0.095	0.574
20	1.931	24.23	6	VV	0.070	0.439
21	2.014	42.29	7	VV	0.099	0.766
22	2.084	11.62	7	VV	0.028	0.210
23	2.109	8.55	7	VV	0.021	0.155
24	2.154	21.72	8	VV	0.048	0.393
25	2.202	24.70	8	VV	0.050	0.447
26	2.243	16.53	8	VV	0.033	0.299
27	2.300	17.91	9	VV	0.034	0.324
28	2.353	30.47	10	VV	0.051	0.552
29	2.383	28.03	12	VV	0.040	0.508
30	2.419	37.53	12	VV	0.051	0.680
31	2.481	54.13	16	VV	0.058	0.980
32	2.529	55.11	14	VV	0.065	0.998
33	2.589	24.53	14	VV	0.029	0.444
34	2.618	24.57	15	VV	0.027	0.445
35	2.663	61.85	19	VV	0.055	1.120
36	2.730	55.00	17	VV	0.055	0.996
37	2.815	107.30	18	VV	0.097	1.943
38	2.863	29.42	19	VV	0.026	0.533
39	2.886	22.32	19	VV	0.020	0.404
40	2.935	65.75	20	VV	0.055	1.190
41	2.975	43.39	21	VV	0.035	0.786
42	3.017	52.52	21	VV	0.042	0.951
43	3.077	44.52	21	VV	0.035	0.806
44	3.081	35.49	22	VV	0.027	0.643
45	3.131	64.39	24	VV	0.046	1.166

Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 2
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.03.02 [341]

Pk	Ret Time	Area	Height	Peak	Width	Response %
46	3.156	39.35	23	VV	0.028	0.713
47	3.184	37.47	24	VV	0.026	0.678
48	3.240	46.65	24	VV	0.033	0.845
49	3.241	31.10	24	VV	0.022	0.563
50	3.263	29.68	24	VV	0.020	0.537
51	3.325	124.63	25	VV	0.082	2.257
52	3.370	55.42	25	VV	0.037	1.003
53	3.408	40.23	25	VV	0.027	0.728
54	3.435	40.50	26	VV	0.026	0.733
55	3.463	76.88	26	VV	0.050	1.392
56	3.516	65.61	25	VV	0.044	1.188
57	3.558	46.57	25	VV	0.031	0.843
58	3.590	41.97	25	VV	0.028	0.760
59	3.616	34.17	25	VV	0.023	0.619
60	3.638	32.96	25	VV	0.022	0.597
61	3.662	35.97	26	VV	0.023	0.651
62	3.712	85.12	25	VV	0.056	1.541
63	3.743	37.71	25	VV	0.025	0.683
64	3.777	72.52	26	VV	0.047	1.313
65	3.815	36.65	25	VV	0.024	0.664
66	3.836	26.79	25	VV	0.018	0.485
67	3.855	28.29	26	VV	0.018	0.512
68	3.874	31.40	27	VV	0.020	0.569
69	3.910	60.58	27	VV	0.037	1.097
70	3.934	40.63	27	VV	0.025	0.736
71	3.960	50.33	27	VV	0.031	0.911
72	4.023	83.73	29	VV	0.048	1.516
73	4.043	51.31	30	VV	0.028	0.929
74	4.097	250.34	36	VV	0.116	4.533
75	4.199	29.41	29	VV	0.017	0.532
76	4.237	77.40	30	VV	0.043	1.401
77	4.264	55.90	30	VV	0.031	1.012
78	4.293	32.51	29	VV	0.019	0.589
79	4.314	38.46	29	VV	0.022	0.696
80	4.337	84.38	29	VV	0.049	1.528
81	4.390	46.16	28	VV	0.028	0.836
82	4.424	54.61	28	VV	0.033	0.989
83	4.450	49.07	27	VV	0.031	0.888
84	4.481	34.39	26	VV	0.022	0.623
85	4.508	72.53	25	VV	0.048	1.313
86	4.557	63.87	24	VV	0.045	1.157
87	4.606	55.66	23	VV	0.041	1.008
88	4.640	28.50	23	VV	0.021	0.516
89	4.663	96.06	23	VV	0.069	1.739
90	4.732	25.76	22	VV	0.019	0.466
91	4.754	48.90	23	VV	0.036	0.885

Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 3
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.03.02 [341]

Pk	Ret Time	Area	Height	Peak	Width	Response %
92	4.803	78.29	22	VV	0.058	1.418
93	4.851	29.59	22	VV	0.023	0.536
94	4.876	34.98	21	VV	0.028	0.633
95	4.908	46.06	22	VV	0.035	0.834
96	4.947	34.85	22	VM	0.026	0.631
97	4.953	42.21	22	MV	0.032	0.764
98	5.009	47.40	21	VV	0.037	0.858
99	5.040	52.08	21	VV	0.041	0.943
100	5.075	22.13	21	VV	0.017	0.401
101	5.099	69.86	22	VV	0.054	1.265
102	5.155	54.20	21	VV	0.042	0.981
103	5.210	49.39	22	VV	0.038	0.894
104	5.234	61.23	22	VV	0.047	1.109
105	5.279	25.37	21	VV	0.020	0.459
106	5.303	36.64	21	VV	0.029	0.663
107	5.329	26.61	21	VV	0.021	0.482
108	5.355	50.22	21	VV	0.040	0.909
109	5.394	87.85	21	VV	0.071	1.591
110	5.483	41.84	18	VV	0.038	0.758
111	5.512	42.80	18	VM	0.039	0.775
112	5.561	150.31	18	MV	0.136	2.722
113	5.694	93.49	15	VV	0.102	1.693
114	5.803	93.74	14	VM	0.114	1.697
115	5.922	10.81	12	MV	0.015	0.196
116	5.939	31.80	12	VV	0.045	0.576
117	5.983	47.74	11	VV	0.073	0.864
118	6.065	13.59	10	VV	0.023	0.246
119	6.096	28.00	10	VV	0.048	0.507
120	6.139	29.43	9	VV	0.055	0.533
121	6.197	31.83	8	VV	0.063	0.576
122	6.263	28.88	7	VV	0.064	0.523
123	6.327	26.81	7	VV	0.066	0.485
124	6.400	28.68	6	VV	0.080	0.519
125	6.483	5.92	5	VV	0.019	0.107
126	6.502	19.80	5	VM	0.068	0.358
127	6.571	3.13	4	MV	0.013	0.057
128	6.588	4.87	4	VV	0.019	0.088
129	6.610	14.91	4	VV	0.059	0.270
130	6.672	17.81	4	VV	0.077	0.323
131	6.749	11.34	4	VV	0.051	0.205
132	6.808	16.43	4	VV	0.077	0.297
133	6.881	3.09	3	VV	0.016	0.056
134	6.904	13.64	3	VV	0.071	0.247
135	6.976	4.63	3	VV	0.026	0.084
136	7.004	5.00	3	VV	0.029	0.091
137	7.029	3.33	3	VV	0.020	0.060

Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 4
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.03.02 [341]

Pk	Ret Time	Area	Height	Peak	Width	Response %
138	7.072	9.78	3	VV	0.058	0.177
139	7.110	3.36	3	VV	0.021	0.061
140	7.138	11.83	3	VV	0.075	0.214
141	7.235	12.84	3	VV	0.083	0.232
142	7.314	9.37	2	VV	0.066	0.170
143	7.369	5.15	2	VV	0.038	0.093
144	7.403	12.28	2	VV	0.089	0.222
145	7.508	7.73	2	VV	0.061	0.140
146	7.558	1.99	2	VV	0.017	0.036
147	7.579	4.36	2	VV	0.036	0.079
148	7.618	7.41	2	VV	0.064	0.134
149	7.680	2.25	2	VV	0.021	0.041
150	7.733	10.99	2	VV	0.101	0.199
151	7.809	2.50	2	VV	0.025	0.045
152	7.837	5.66	2	VV	0.057	0.103
153	7.889	5.36	2	VV	0.057	0.097
154	7.956	7.16	2	VV	0.079	0.130
155	8.031	5.16	1	VV	0.061	0.093
156	8.116	6.26	1	VV	0.079	0.113
157	8.176	2.71	1	VV	0.037	0.049
158	8.211	1.25	1	VV	0.017	0.023
159	8.227	1.13	1	VV	0.016	0.020
160	8.259	3.51	1	VV	0.049	0.064
161	8.305	4.02	1	VV	0.059	0.073
162	8.354	3.94	1	VV	0.060	0.071
163	8.438	4.52	1	VV	0.073	0.082
164	8.492	7.36	1	VV	0.124	0.133
165	8.636	2.13	1	VV	0.040	0.039
166	8.670	1.34	1	VV	0.027	0.024
167	8.700	2.77	1	VV	0.056	0.050
168	8.757	3.12	1	VV	0.067	0.057
169	8.820	1.66	1	VV	0.039	0.030
170	8.870	3.22	1	VV	0.078	0.058
171	8.946	0.70	1	VV	0.020	0.013
172	8.974	1.83	1	VV	0.052	0.033
173	9.037	2.24	1	VV	0.063	0.041
174	9.091	0.96	1	VV	0.030	0.017
175	9.117	3.83	1	VV	0.127	0.069
176	9.260	0.51	0	VV	0.020	0.009
177	9.282	0.66	0	VV	0.026	0.012
178	9.312	0.86	0	VV	0.035	0.016
179	9.348	2.19	0	VV	0.098	0.040
180	9.449	0.86	0	VV	0.048	0.016
181	9.509	0.83	0	VV	0.048	0.015
182	9.549	1.28	0	VV	0.080	0.023
183	9.664	0.43	0	VV	0.037	0.008

Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 5
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH

Software Revision: Rev. B.03.02 [341]

Pk	Ret Time	Area	Height	Peak	Width	Response %
184	9.686	0.84	0	VV	0.071	0.015
185	9.767	0.30	0	VV	0.032	0.005
186	9.829	0.61	0	VV	0.091	0.011
187	9.947	0.12	0	VV	0.038	0.002
188	9.997	0.01	0	VM	0.011	0.000

Total area = 5523.09

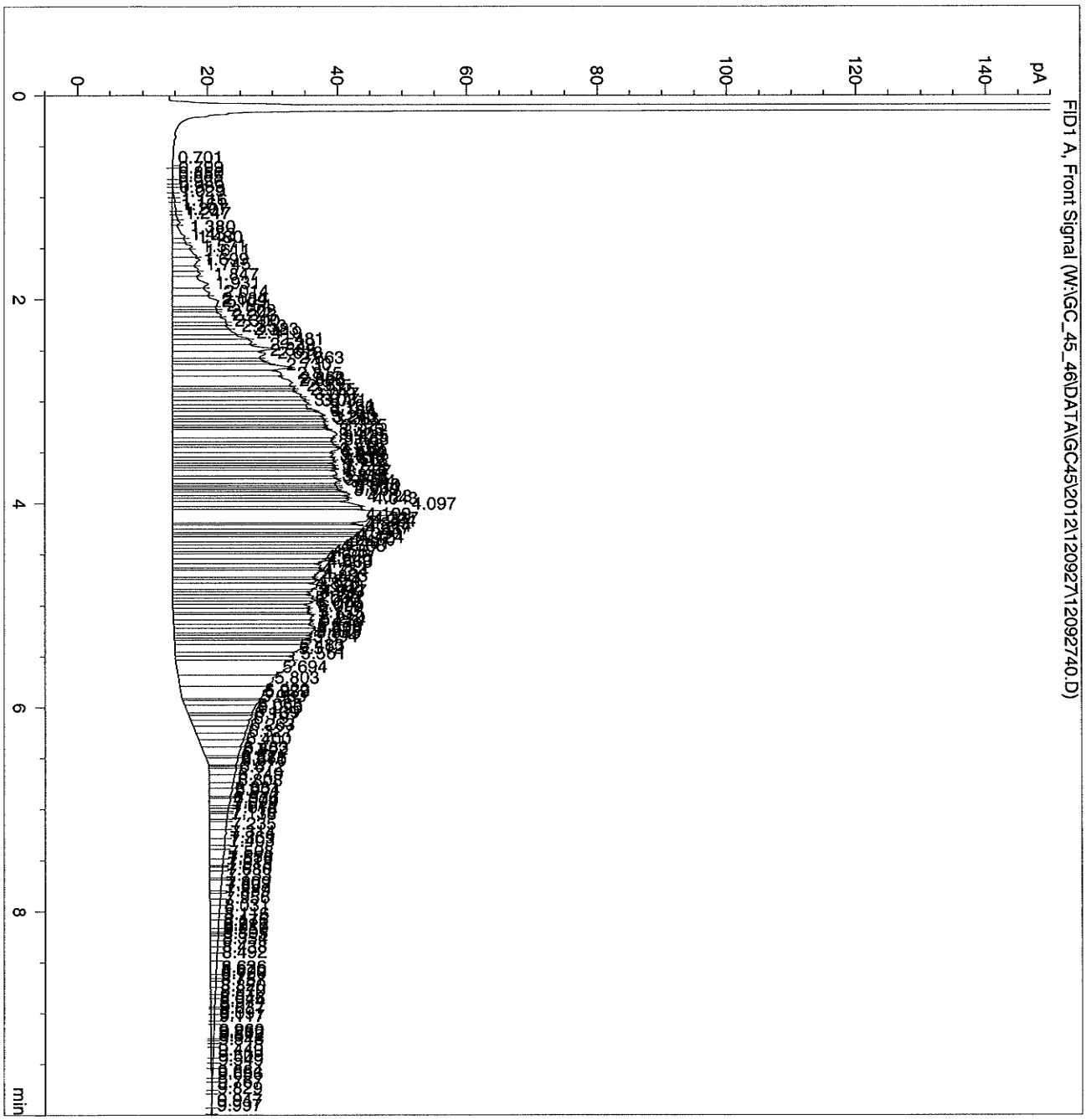
Area Percent Report

Data File Name : W:\GC_45_46\DATA\GC45\2012\120927\12092740.D
Page Number : 6
Operator : FZ/YW
Instrument : GC 45
Sample Name : 12-09-1439-9 20X

Vial Number : Vial 32
Injection Number : 1
Sequence Line : 40
Instrument Method: C:\CHEM32\2\METHODS\TPH4->

Acquired on : 27 Sep 12 7:02:33 PM
Report Created on: 28 Sep 12 02:39 pm

Analysis Method : 8015B.MTH



Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

TriHydro Corporation		Date Received:	09/24/12
2501 Cherry Street, Suite 200		Work Order No:	12-09-1490
Signal Hill, CA 90755-2070		Preparation:	EPA 5035
		Method:	EPA 8015B (M)

Project: LARC Soil Characterization Analysis 436-087-001

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-25@4'	**12-09-1490-13-F**	**09/24/12 12:38**	**Solid**	**GC 22**	**09/25/12**	**09/25/12 19:25**	**120925B01**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	ND	0.24	0.048	0.95		mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	94	60-126	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-25@8'	**12-09-1490-14-E**	**09/24/12 12:48**	**Solid**	**GC 22**	**09/25/12**	**09/26/12 01:22**	**120925B02**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	260	110	23	458	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	95	60-126	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-26@4'	**12-09-1490-15-E**	**09/24/12 14:33**	**Solid**	**GC 22**	**09/25/12**	**09/26/12 01:54**	**120925B02**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	640	110	21	425	HD	mg/kg

Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	98	60-126	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SB-26@8'	**12-09-1490-16-E**	**09/24/12 14:43**	**Solid**	**GC 22**	**09/25/12**	**09/26/12 02:26**	**120925B02**

Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
TPH as Gasoline	220	89	18	357	HD	mg/kg

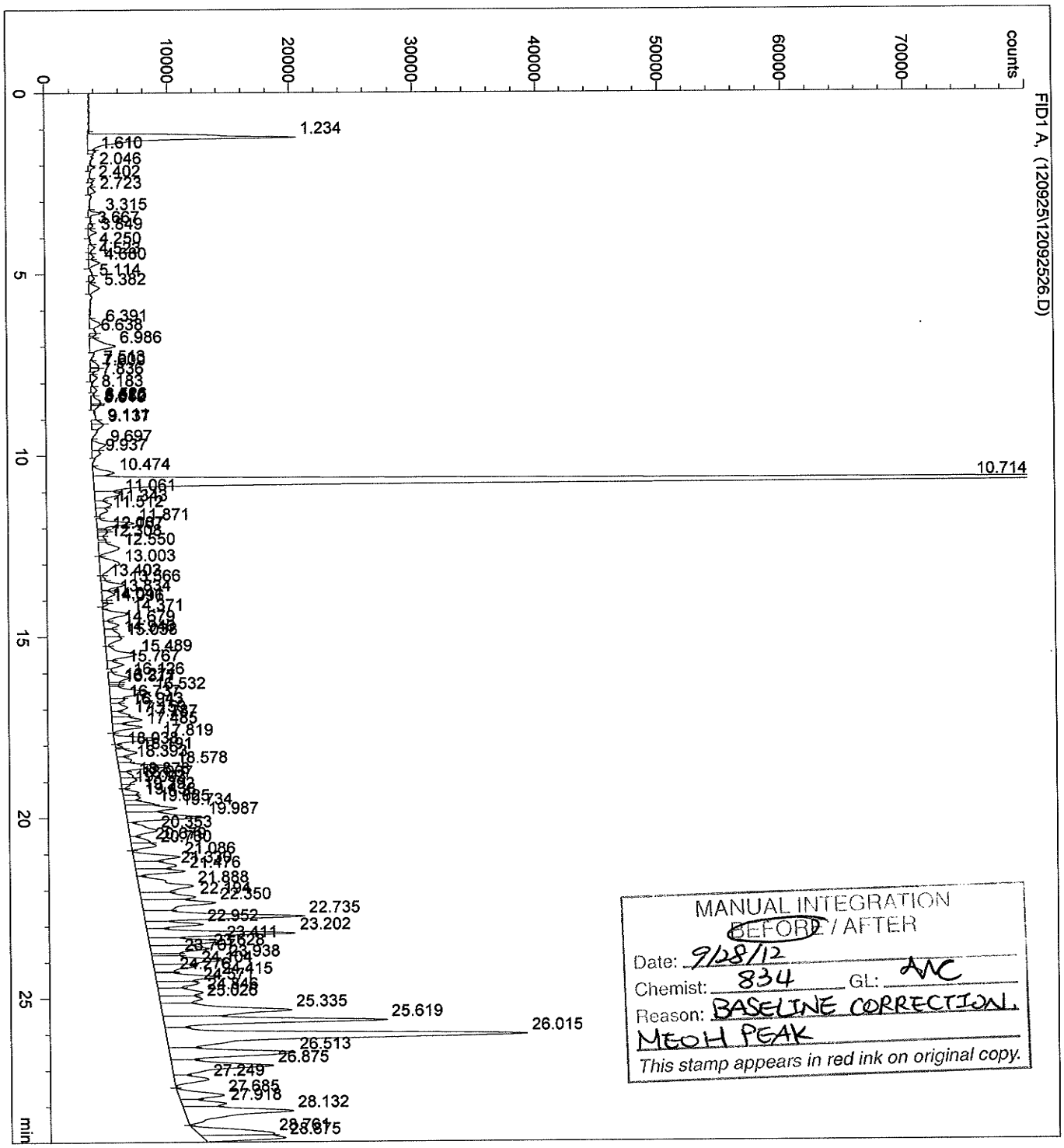
Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	92	60-126	

Return to Contents

Area Percent Report

Data File Name : W:\DATA\2012\120925\12092526.D
Operator : AD
Instrument : GC 22
Sample Name : 1490-14E5.46 20u 458X
Run Time Bar Code:
Acquired on : 26 Sep 12 01:22 am
Report Created on: 26 Sep 12 02:18 pm

Page Number : 3
Vial Number : Vial 26
Injection Number : 1
Sequence Line : 26
Instrument Method: 80158021.M
Analysis Method : 8015B(M).MTH



MANUAL INTEGRATION
BEFORE / AFTER
Date: 9/28/12
Chemist: 834 GL: ANC
Reason: BASELINE CORRECTION.
MeOH PEAK
This stamp appears in red ink on original copy.

Area Percent Report

Data File Name : W:\DATA\2012\120925\12092527.D
Operator : AD
Instrument : GC 22
Sample Name : 1490-15E5.88 20u 4x5X
Run Time Bar Code:
Acquired on : 26 Sep 12 01:54 am
Report Created on: 26 Sep 12 02:26 pm

Page Number : 1
Vial Number : Vial 27
Injection Number : 1
Sequence Line : 27
Instrument Method: 80158021.M
Analysis Method : 8015B(M).MTH

Sig. 1 in W:\DATA\2012\120925\12092527.D

Pk	Ret Time	Area	Height	Peak	Width	Response %
1	1.607	6271	1607	VV	0.065	0.035
2	1.689	4746	1389	VV	0.057	0.026
3	2.040	6117	1284	VV	0.079	0.034
4	2.400	5019	968	VV	0.086	0.028
5	2.493	3754	800	VV	0.078	0.021
6	2.722	12638	1660	VV	0.127	0.070
7	2.849	1596	377	VV	0.071	0.009
8	3.309	12873	2278	VV	0.094	0.071
9	3.526	1706	421	VV	0.068	0.009
10	3.656	5103	850	VV	0.100	0.028
11	3.840	9072	1474	VV	0.103	0.050
12	4.249	7470	944	VV	0.132	0.041
13	4.490	1896	636	VV	0.050	0.010
14	4.516	2843	673	VV	0.070	0.016
15	4.686	14206	1751	VV	0.135	0.078
16	4.993	2137	510	VV	0.070	0.012
17	5.134	6653	863	VV	0.128	0.037
18	5.384	16153	1470	VV	0.183	0.089
19	6.367	12502	1128	VV	0.185	0.069
20	6.613	3259	889	VV	0.061	0.018
21	6.619	1529	909	VV	0.028	0.008
22	6.651	3662	901	VV	0.068	0.020
23	6.987	49432	3677	VV	0.224	0.273
24	7.220	4516	752	VV	0.100	0.025
25	7.530	12581	1462	VV	0.143	0.069
26	7.594	11184	1483	VV	0.126	0.062
27	7.837	4134	1131	VV	0.061	0.023
28	7.852	7780	1120	VV	0.116	0.043
29	8.180	9677	995	VV	0.162	0.053
30	8.550	13872	1625	VV	0.142	0.077
31	8.554	6285	1648	VV	0.064	0.035
32	8.617	7927	1476	VV	0.090	0.044
33	8.743	1635	806	VV	0.034	0.009
34	8.827	1810	914	VV	0.033	0.010
35	8.896	2368	1010	VV	0.039	0.013
36	8.924	2340	1022	VV	0.038	0.013
37	8.997	2758	1132	VV	0.041	0.015
38	9.143	15142	2288	VV	0.110	0.084
39	9.160	18115	2308	VV	0.131	0.100
40	9.326	10891	1265	VV	0.143	0.060
41	9.695	31455	2552	VV	0.205	0.174
42	9.940	22532	1809	VV	0.208	0.124
43	10.159	1796	685	VV	0.044	0.010
44	10.463	42744	4231	VV	0.168	0.236
45	10.713	929035	118347	VV	0.131	5.130
46	11.071	44324	4284	VV	0.172	0.245
47	11.352	42278	3828	VV	0.184	0.233
48	11.517	27089	3004	VV	0.150	0.150
49	11.665	7099	1655	VV	0.072	0.039
50	11.868	80983	8598	VV	0.157	0.447
51	12.083	36959	3346	VV	0.184	0.204
52	12.210	2798	2743	VV	0.017	0.015
53	12.330	17526	3237	VV	0.090	0.097
54	12.343	12570	3302	VV	0.063	0.069
55	12.549	96586	5861	VV	0.275	0.533

Area Percent Report

Data File Name : W:\DATA\2012\120925\12092527.D
Operator : AD
Instrument : GC 22
Sample Name : 1490-15E5.88 20u 4YSX
Run Time Bar Code:
Acquired on : 26 Sep 12 01:54 am
Report Created on: 26 Sep 12 02:26 pm

Page Number : 2
Vial Number : Vial 27
Injection Number : 1
Sequence Line : 27
Instrument Method: 80158021.M
Analysis Method : 8015B(M).MTH

Pk	Ret Time	Area	Height	Peak	Width	Response %
56	12.910	44206	5356	VV	0.138	0.244
57	12.955	12478	5426	VV	0.038	0.069
58	12.986	73733	5429	VV	0.226	0.407
59	13.360	44215	4535	VV	0.162	0.244
60	13.567	74946	6603	VV	0.189	0.414
61	13.700	7124	4139	VV	0.029	0.039
62	13.834	82987	5494	VV	0.252	0.458
63	14.064	34875	3940	VV	0.148	0.193
64	14.375	148661	11161	VV	0.222	0.821
65	14.670	71953	6387	VV	0.188	0.397
66	14.923	60708	6845	VV	0.148	0.335
67	14.953	10260	6824	VV	0.025	0.057
68	15.038	99406	7526	VV	0.220	0.549
69	15.480	188995	11436	VV	0.275	1.044
70	15.771	94129	7826	VV	0.200	0.520
71	15.921	33024	5846	VV	0.094	0.182
72	16.134	103286	9516	VV	0.181	0.570
73	16.272	87757	8994	VV	0.163	0.485
74	16.536	181433	12808	VV	0.236	1.002
75	16.701	17940	7799	VV	0.038	0.099
76	16.733	53476	7804	VV	0.114	0.295
77	16.959	95538	8546	VV	0.186	0.528
78	17.287	227292	14897	VV	0.254	1.255
79	17.486	109498	12351	VV	0.148	0.605
80	17.614	69109	9985	VV	0.115	0.382
81	17.816	195776	18708	VV	0.174	1.081
82	18.206	215150	14645	VV	0.245	1.188
83	18.389	117440	12943	VV	0.151	0.648
84	18.605	305789	28574	VV	0.178	1.688
85	18.973	367416	15713	VV	0.390	2.029
86	19.343	106572	12862	VV	0.138	0.588
87	19.446	110659	15500	VV	0.119	0.611
88	19.617	156719	20846	VV	0.125	0.865
89	19.727	293781	26353	VV	0.186	1.622
90	19.994	379055	27240	VV	0.232	2.093
91	20.352	355351	20259	VV	0.292	1.962
92	20.640	218638	18697	VV	0.195	1.207
93	20.773	198329	18863	VV	0.175	1.095
94	21.099	348307	25463	VV	0.228	1.923
95	21.321	286910	24870	VV	0.192	1.584
96	21.477	203444	22227	VV	0.153	1.123
97	21.738	219428	22222	VV	0.165	1.212
98	21.910	413090	28314	VV	0.243	2.281
99	22.202	289024	26318	VV	0.183	1.596
100	22.350	373423	25429	VV	0.245	2.062
101	22.742	658955	61375	VV	0.179	3.639
102	22.955	258651	26397	VV	0.163	1.428
103	23.212	429340	40367	VV	0.177	2.371
104	23.418	371717	29936	VV	0.207	2.053
105	23.623	231916	24704	VV	0.156	1.281
106	23.943	720180	29447	VV	0.408	3.977
107	24.413	338082	26632	VV	0.212	1.867
108	24.587	185126	20900	VV	0.148	1.022
109	24.839	311528	23215	VV	0.224	1.720
110	25.039	274320	23791	VV	0.192	1.515
111	25.351	593795	33928	VV	0.292	3.279

Area Percent Report

Data File Name : W:\DATA\2012\120925\12092527.D
Operator : AD
Instrument : GC 22
Sample Name : 1490-15E5.88 20u 425X
Run Time Bar Code:
Acquired on : 26 Sep 12 01:54 am
Report Created on: 26 Sep 12 02:26 pm

Page Number : 3
Vial Number : Vial 27
Injection Number : 1
Sequence Line : 27
Instrument Method: 80158021.M
Analysis Method : 8015B(M).MTH

Pk	Ret Time	Area	Height	Peak	Width	Response %
112	25.625	583126	50015	VV	0.194	3.220
113	26.040	1113334	62907	VV	0.295	6.148
114	26.519	489735	30607	VV	0.267	2.704
115	26.881	566147	29237	VV	0.323	3.126
116	27.237	101347	18584	VV	0.091	0.560
117	27.245	218383	18669	VV	0.195	1.206
118	27.680	389940	22019	VV	0.295	2.153
119	27.912	237749	20623	VV	0.192	1.313
120	28.129	538123	24414	VV	0.367	2.971
121	28.777	299339	22706	VV	0.220	1.653
122	28.879	298652	24714	VM	0.201	1.649

Total area = 18110243

Appendix A
Philips 66 Crude Capacity Project
Emissions Summary

Emission per Barrel (lb/1000 bbl delivered)

Project Emissions	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Panamax	1.0	2.4	27.8	0.8	0.5	0.4	0.2
Aframax	0.5	1.3	14.6	0.5	0.2	0.2	0.2
Suezmax	0.5	1.2	14.4	0.5	0.2	0.2	0.3

Emission per Barrel (lb/1000 bbl delivered)

Existing	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Panamax	1.0	2.4	27.8	0.8	0.5	0.4	0.2
Aframax	0.7	1.7	19.8	0.8	0.4	0.3	0.4
Suezmax	0.7	1.6	19.0	0.7	0.3	0.3	0.5

Net Emission per Barrel (lb/1000 bbl delivered) - Project Panamax Compared to Existing Vessels

Existing	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Panamax	-	-	-	-	-	-	-

Net Emission per Barrel (lb/1000 bbl delivered) - Project Aframax Compared to Existing Vessels

Existing	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Panamax	(0.5)	(1.2)	(13.2)	(0.3)	(0.2)	(0.2)	0.1
Aframax	(0.2)	(0.5)	(5.2)	(0.3)	(0.1)	(0.1)	(0.1)
Suezmax	(0.1)	(0.4)	(4.3)	(0.2)	(0.1)	(0.1)	(0.2)

Net Emission per Barrel (lb/1000 bbl delivered) - Project Suezmax Compared to Existing Vessels

Existing	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Panamax	(0.5)	(1.2)	(13.4)	(0.3)	(0.2)	(0.2)	0.1
Aframax	(0.2)	(0.5)	(5.4)	(0.3)	(0.1)	(0.1)	(0.1)
Suezmax	(0.2)	(0.4)	(4.5)	(0.2)	(0.1)	(0.1)	(0.2)

Appendix A
Philips 66 Crude Capacity Project
Panamax Parameters

OGV Main Engine Usage per One-Way Transit

Activity	Propulsion Max kW [1]	Speed (Kts) [1]	Load Factor [2]	Distance (nm/trip) [3]	Duration (hr/trip)	Energy Consumed (kW-hr/trip)
California to AQMD Overwater Boundary [4]	11,060	14.8	1.00	110.0	7.43	82,203
Fairway: AQMD Overwater Boundary to 20-Mile [5]	11,060	12.0	0.53	22.9	1.90	11,226
Fairway: 20-Mile to Precautionary Zone [5]	11,060	12.0	0.53	20.0	1.67	9,826
Precautionary Zone [6,7]	11,060	9.0	0.22	8.1	0.90	2,238
Harbor Transit Inbound [8]	11,060	5.0	0.04	3.5	0.70	299
Harbor Transit Outbound [8]	11,060	8.0	0.16	3.5	0.44	764
Turning [8]	11,060	n/a	0.02	n/a	0.25	55
Docking [8]	11,060	n/a	0.02	n/a	0.25	55
Hoteling [9]	11,060	n/a	-	n/a	8.00	-
Anchorage [10]	11,060	n/a	-	n/a	-	-

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table A.3 (Starcrest 2012)

(2) Load factor = (speed/max speed)$^{3.}$ Load factor of 0.02 represents minimum load factor for propulsion engines.

(3) Distances from Starcrest (2010), except for California to AQMD and harbor, which were measured from a map. Assumes northern route.

Average One-Way Transit Distances	nmiles
California to AQMD Boundary	110.0
Fairway 1-way nm	42.9
20nm 1-way Distance within Fairway	20.0
PZ to Breakwater 1-way nm	8.1

(4) Assume no Vessel Speed Reduction (VSR).

(5) Assume VSR to 12 knots.

(6) Portion of transit that occurs from PZ boundary to the breakwater.

(7) Average speeds in the precautionary zone are from POLB Air Emissions Inventory 2011 - Table 2.4 (Starcrest 2012)

(8) In harbor transit times and load factors from POLB Air Emissions Inventory 2005 - pg.67 (Starcrest 2007)

(9) Assumes 320,000 barrels unloaded at 40,000 barrels per hour.

(10) Assumes no anchorage.

OGV Auxiliary Generator Usage per One-Way Transit

Activity	Auxiliary kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	630	7.43	4,682
Fairway: AQMD Overwater Boundary to 20-Mile	630	1.90	1,200
Fairway: 20-Mile to Precautionary Zone	630	1.67	1,050
Precautionary Zone	630	0.90	567
Harbor Transit Inbound	867	0.70	607
Harbor Transit Outbound	867	0.44	379
Turning	867	0.25	217
Docking	867	0.25	217
Hoteling	683	8.0	5,464
Anchorage	630	-	-

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.12 (Starcrest 2012)

OGV Auxiliary Boiler Usage per One-Way Transit

Activity	Boiler kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	-	7.43	-
Fairway: AQMD Overwater Boundary to 20-Mile	-	1.90	-
Fairway: 20-Mile to Precautionary Zone	-	1.67	-
Precautionary Zone	-	0.90	-
Harbor Transit Inbound	371	0.70	259.700
Harbor Transit Outbound	371	0.44	162.313
Turning	371	0.25	92.750
Docking	371	0.25	92.750
Hoteling	3,000	8.0	24,000.000
Anchorage	371	-	-

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.16 (Starcrest 2012)

Tugboat Usage during Assists

Engine Type	Tugboat Max Hp [1]	Load Factor [2]	Hours/ Assist [3]	Tugboats per Assist	kW-Hrs/ Assist
Main Engine	5,080	0.31	3.28	2	7,695
Auxiliary Generator	850	0.43	3.28	2	1,786

Notes: (1) Based on 2 engines per vessel. Port of Long Beach Air Emissions Inventory - 2011 - Table 3.1, 3.2 (Starcrest 2012)

(2) Port of Long Beach Air Emissions Inventory - 2011 - Table 3.3 (Starcrest 2012)

(3) Time spent operating per vessel trip. Assumed to be equal to vessel "Harbor" transit times 2 to account for tug movement and assist time.

Appendix A
Philips 66 Crude Capacity Project
Aframax Parameters

OGV Main Engine Usage per One-Way Transit

Activity	Propulsion Max kW [1]	Speed (Kts) [1]	Load Factor [2]	Distance (nm/trip) [3]	Duration (hr/trip)	Energy Consumed (kW-hr/trip)
California to AQMD Overwater Boundary [4]	13,319	15.1	1.00	110.0	7.28	97,026
Fairway: AQMD Overwater Boundary to 20-Mile [5]	13,319	12.0	0.50	22.9	1.90	12,729
Fairway: 20-Mile to Precautionary Zone [5]	13,319	12.0	0.50	20.0	1.67	11,141
Precautionary Zone [6,7]	13,319	9.0	0.21	8.1	0.90	2,538
Harbor Transit Inbound [8]	13,319	5.0	0.04	3.5	0.70	338
Harbor Transit Outbound [8]	13,319	8.0	0.15	3.5	0.44	867
Turning [8]	13,319	n/a	0.02	n/a	0.25	67
Docking [8]	13,319	n/a	0.02	n/a	0.25	67
Hoteling [9]	13,319	n/a	-	n/a	18.00	-
Anchorage [10]	13,319	n/a	-	n/a	168.00	-

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table A.3 (Starcrest 2012)
(2) Load factor = (speed/max speed)$^{3.}$ Load factor of 0.02 represents minimum load factor for propulsion engines.
(3) Distances from Starcrest (2010), except for California to AQMD and harbor, which were measured from a map. Assumes northern route.

Average One-Way Transit Distances	nmiles
California to AQMD Boundary	110.0
Fairway 1-way nm	42.9
20nm 1-way Distance within Fairway	20.0
PZ to Breakwater 1-way nm	8.1

(4) Assume no Vessel Speed Reduction (VSR).
(5) Assume VSR to 12 knots.
(6) Portion of transit that occurs from PZ boundary to the breakwater.
(7) Average speeds in the precautionary zone are from POLB Air Emissions Inventory 2011 - Table 2.4 (Starcrest 2012)
(8) In harbor transit times and load factors from POLB Air Emissions Inventory 2005 - pg.67 (Starcrest 2007)
(9) Assumes 720,000 barrels unloaded at 40,000 barrels per hour.
(10) Assumes 7 days of anchorage.

OGV Auxiliary Generator Usage per One-Way Transit

Activity	Auxiliary kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	584	7.28	4,254
Fairway: AQMD Overwater Boundary to 20-Mile	584	1.90	1,112
Fairway: 20-Mile to Precautionary Zone	584	1.67	973
Precautionary Zone	584	0.90	526
Harbor Transit Inbound	803	0.70	562
Harbor Transit Outbound	803	0.44	351
Turning	803	0.25	201
Docking	803	0.25	201
Hoteling	632	18.0	11,376
Anchorage	584	168.0	98,112

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.12 (Starcrest 2012)

OGV Auxiliary Boiler Usage per One-Way Transit

Activity	Boiler kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	-	7.28	-
Fairway: AQMD Overwater Boundary to 20-Mile	-	1.90	-
Fairway: 20-Mile to Precautionary Zone	-	1.67	-
Precautionary Zone	-	0.90	-
Harbor Transit Inbound	371	0.70	259.700
Harbor Transit Outbound	371	0.44	162.313
Turning	371	0.25	92.750
Docking	371	0.25	92.750
Hoteling	3,000	18.0	54,000.000
Anchorage	371	168.0	62,328.000

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.16 (Starcrest 2012)

Tugboat Usage during Assists

Engine Type	Tugboat Max Hp [1]	Load Factor [2]	Hours/ Assist [3]	Tugboats per Assist	kW-Hrs/ Assist
Main Engine	5,080	0.31	3.28	2	7,695
Auxiliary Generator	850	0.43	3.28	2	1,786

Notes: (1) Based on 2 engines per vessel. Port of Long Beach Air Emissions Inventory - 2011 - Table 3.1, 3.2 (Starcrest 2012)
(2) Port of Long Beach Air Emissions Inventory - 2011 - Table 3.3 (Starcrest 2012)
(3) Time spent operating per vessel trip. Assumed to be equal to vessel "Harbor" transit times 2 to account for tug movement and assist time.

Appendix A
Philips 66 Crude Capacity Project
Suezmax Parameters

OGV Main Engine Usage per One-Way Transit

Activity	Propulsion Max kW [1]	Speed (Kts) [1]	Load Factor [2]	Distance (nm/trip) [3]	Duration (hr/trip)	Energy Consumed (kW-hr/trip)
California to AQMD Overwater Boundary [4]	18,587	15.3	1.00	110.0	7.19	133,632
Fairway: AQMD Overwater Boundary to 20-Mile [5]	18,587	12.0	0.48	22.9	1.90	17,076
Fairway: 20-Mile to Precautionary Zone [5]	18,587	12.0	0.48	20.0	1.67	14,946
Precautionary Zone [6,7]	18,587	9.0	0.20	8.1	0.90	3,405
Harbor Transit Inbound [8]	18,587	5.0	0.03	3.5	0.70	454
Harbor Transit Outbound [8]	18,587	8.0	0.14	3.5	0.44	1,162
Turning [8]	18,587	n/a	0.02	n/a	0.25	93
Docking [8]	18,587	n/a	0.02	n/a	0.25	93
Hoteling [9]	18,587	n/a	-	n/a	25.00	-
Anchorage [10]	18,587	n/a	-	n/a	168.00	-

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table A.3 (Starcrest 2012)
(2) Load factor = (speed/max speed)$^{3.}$ Load factor of 0.02 represents minimum load factor for propulsion engines.
(3) Distances from Starcrest (2010), except for California to AQMD and harbor, which were measured from a map. Assumes northern route.

Average One-Way Transit Distances	nmiles
California to AQMD Boundary	110.0
Fairway 1-way nm	42.9
20nm 1-way Distance within Fairway	20.0
PZ to Breakwater 1-way nm	8.1

(4) Assume no Vessel Speed Reduction (VSR).
(5) Assume VSR to 12 knots.
(6) Portion of transit that occurs from PZ boundary to the breakwater.
(7) Average speeds in the precautionary zone are from POLB Air Emissions Inventory 2011 - Table 2.4 (Starcrest 2012)
(8) In harbor transit times and load factors from POLB Air Emissions Inventory 2005 - pg.67 (Starcrest 2007)
(9) Assumes 1,000,000 barrels unloaded at 40,000 barrels per hour.
(10) Assumes 7 days of anchorage.

OGV Auxiliary Generator Usage per One-Way Transit

Activity	Auxiliary kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	718	7.19	5,162
Fairway: AQMD Overwater Boundary to 20-Mile	718	1.90	1,367
Fairway: 20-Mile to Precautionary Zone	718	1.67	1,197
Precautionary Zone	718	0.90	646
Harbor Transit Inbound	988	0.70	692
Harbor Transit Outbound	988	0.44	432
Turning	988	0.25	247
Docking	988	0.25	247
Hoteling	778	25.0	19,450
Anchorage	718	168.0	120,624

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.12 (Starcrest 2012)

OGV Auxiliary Boiler Usage per One-Way Transit

Activity	Boiler kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Point Conception to AQMD Overwater Boundary	-	7.19	-
Fairway: AQMD Overwater Boundary to 20-Mile	-	1.90	-
Fairway: 20-Mile to Precautionary Zone	-	1.67	-
Precautionary Zone	-	0.90	-
Harbor Transit Inbound	371	0.70	259.700
Harbor Transit Outbound	371	0.44	162.313
Turning	371	0.25	92.750
Docking	371	0.25	92.750
Hoteling	3,000	25.0	75,000.000
Anchorage	371	168.0	62,328.000

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.16 (Starcrest 2012)

Tugboat Usage during Assists

Engine Type	Tugboat Max Hp [1]	Load Factor [2]	Hours/ Assist [3]	Tugboats per Assist	kW-Hrs/ Assist
Main Engine	5,080	0.31	3.28	2	7,695
Auxiliary Generator	850	0.43	3.28	2	1,786

Notes: (1) Based on 2 engines per vessel. Port of Long Beach Air Emissions Inventory - 2011 - Table 3.1, 3.2 (Starcrest 2012)
(2) Port of Long Beach Air Emissions Inventory - 2011 - Table 3.3 (Starcrest 2012)
(3) Time spent operating per vessel trip. Assumed to be equal to vessel "Harbor" transit times 2 to account for tug movement and assist time.

Appendix A
Philips 66 Crude Capacity Project
Ocean Going Vessel Emission Factors

Emission Factors for OGV

Engine Type	Assumed Fuel Type	Assumed Fuel Use Application	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	Source
Main Propulsion Engine (g/kW-hr)												
OGV Main Engines	MGO (0.1% S)	All (current in-use fuel)	0.60	1.40	17.01	0.42	0.26	0.20	620	0.0120	0.02914	(1,2)
Tugboat Main Engines	CARB (500 ppm S)	2006	0.68	1.97	7.31	0.18	0.36	0.29	683	0.0040	0.03100	(3)
(Medium Speed Diesel)	CARB (15 ppm S)	2007+	0.49	1.97	6.93	0.01	0.31	0.25	683	0.0029	0.02939	(3,4)
Auxiliary Engine (g/kW-hr)												
OGV Auxiliary Engines	MGO (0.1% S)	All (current in-use fuel)	0.40	1.10	13.82	0.49	0.26	0.20	683	0.0080	0.02914	(2,5)
Tugboat Auxiliary Engines	CARB (500 ppm S)	2006	0.81	3.73	5.10	0.18	0.15	0.12	722	0.0100	0.03100	(3)
(High Speed Diesel)	CARB (15 ppm S)	2007+	0.58	3.73	4.74	0.01	0.11	0.09	722	0.0072	0.02939	(3,4)
Auxiliary Boiler (g/kW-hr)												
OGV Auxiliary Boilers	MGO (0.1% S)	All (current in-use fuel)	0.10	0.20	1.97	0.66	0.14	0.10	970	0.002	0.0752	(2,6)

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.5, 2.6. (Starcrest 2012)

(2) Fuel emission factors were adjusted in accordance with lower sulfur fuels. Port of Long Beach Air Emissions Inventory - 2011 - Table 2.17. (Starcrest 2012)

(3) Emission Estimation Methodology for Commericial Harbor Craft Operating in California. (CARB 2007)

(4) Port of Long Beach Air Emissions Inventory - 2011 - Table 3.6. (Starcrest 2012)

(5) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.10, 2.11. (Starcrest 2012)

(6) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.14, 2.15.. (Starcrest 2012)

Load Emission Factor Adjustments for OGV Main Propulsion Engines

Activity	Load Factor	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O
Point Conception to AQMD Overwater Boundary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fairway: AQMD Overwater Boundary to 20-Mile	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fairway: 20-Mile to Precautionary Zone	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Precautionary Zone	0.20	0.98	0.98	1.00	1.00	0.99	0.99	1.00	0.98	1.00
Harbor Transit Inbound	0.03	9.38	5.57	2.51	1.00	3.61	3.61	1.00	9.38	2.51
Harbor Transit Outbound	0.14	1.43	1.39	1.08	1.00	1.13	1.13	1.00	1.43	1.08
Turning	0.02	21.18	9.70	4.63	1.00	7.29	7.29	1.00	21.18	4.63
Docking	0.02	21.18	9.70	4.63	1.00	7.29	7.29	1.00	21.18	4.63
Hoteling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anchorage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: (1) Port of Long Beach Air Emissions Inventory - 2011 - Table 2.7. (Starcrest 2012)

Low-Load Emission Factor Regression Factors for OGV Main Propulsion Engines

Variable	VOC	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O
Exponent	1.5	1	1.5	0	1.5	1.5	0	1.5	1.5
Intercept	0.3859	0.1458	10.4496	0	0.2551	0.2551	0	0.3859	10.4496
Coefficient	0.0667	0.8378	0.1255	1	0.0059	0.0059	1	0.0667	0.1255
Ref. EF @ 20% Load	1.132	4.335	11.853	1	0.321	0.321	1	1.132	11.853

Appendix A
Philips 66 Crude Capacity Project
Panamax Emissions

Total Emissions per Delivery (lb/visit) - Project

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	225.7	530.1	6,451.9	162.4	97.7	78.2	109.9
Ships - AQMD to 20 mile x 2	31.8	75.1	915.2	23.4	14.0	11.2	15.8
Ships - 20 mile to PZ x 2	27.8	65.7	801.1	20.5	12.2	9.8	13.8
Ships - PZ x 2	6.8	16.3	201.9	5.4	3.1	2.5	3.6
Ships - Harbor Transit Inbound	4.3	6.7	47.7	1.3	1.0	0.8	0.9
Ships - Harbor Transit Outbound	1.8	4.3	43.1	1.4	0.7	0.6	0.9
Ships - Turning	1.8	2.2	16.6	0.4	0.4	0.3	0.3
Ships - Docking	1.8	2.2	16.6	0.4	0.4	0.3	0.3
Ships - Hoteling	10.1	23.8	270.9	40.8	10.3	7.9	27.6
Tugboats	10.6	48.1	136.2	0.1	5.6	4.5	6.6
Total	**322.55**	**774.69**	**8,901.33**	**256.10**	**145.45**	**115.99**	**179.74**

Total Emissions per Delivery (lb/visit) - Existing

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	225.7	530.1	6,451.9	162.4	97.7	78.2	109.9
Ships - AQMD to 20 mile x 2	31.8	75.1	915.2	23.4	14.0	11.2	15.8
Ships - 20 mile to PZ x 2	27.8	65.7	801.1	20.5	12.2	9.8	13.8
Ships - PZ x 4	6.8	16.3	201.9	5.4	3.1	2.5	3.6
Ships - Harbor Transit Inbound x 2	4.3	6.7	47.7	1.3	1.0	0.8	0.9
Ships - Harbor Transit Outbound x 2	1.8	4.3	43.1	1.4	0.7	0.6	0.9
Ships - Turning x 2	1.8	2.2	16.6	0.4	0.4	0.3	0.3
Ships - Docking x 2	1.8	2.2	16.6	0.4	0.4	0.3	0.3
Ships - Hoteling	10.1	23.8	270.9	40.8	10.3	7.9	27.6
Ships - Anchorage	-	-	-	-	-	-	-
Tugboats x 2	10.6	48.1	136.2	0.1	5.6	4.5	6.6
Total	**322.55**	**774.69**	**8,901.33**	**256.10**	**145.45**	**115.99**	**179.74**

Emission per Barrel (lb/1000 bbl delivered)

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Project	1.0	2.4	27.8	0.8	0.5	0.4	0.2
Existing	1.0	2.4	27.8	0.8	0.5	0.4	0.2
Delta	-	-	-	-	-	-	-

Appendix A
Philips 66 Crude Capacity Project
Aframax Emissions

Total Emissions per Delivery (lb/visit) - Project

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	264.2	619.6	7,537.8	188.9	113.9	91.1	128.0
Ships - AQMD to 20 mile x 2	35.6	84.0	1,022.6	26.0	15.6	12.4	17.6
Ships - 20 mile to PZ x 2	31.2	73.5	895.1	22.7	13.6	10.9	15.4
Ships - PZ x 2	7.5	18.0	221.8	5.8	3.4	2.7	3.9
Ships - Harbor Transit Inbound	4.8	7.3	50.1	1.3	1.1	0.9	0.9
Ships - Harbor Transit Outbound	2.0	4.6	46.4	1.4	0.8	0.6	1.0
Ships - Turning	2.1	2.5	18.1	0.4	0.4	0.3	0.3
Ships - Docking	2.1	2.5	18.1	0.4	0.4	0.3	0.3
Ships - Hoteling	21.9	51.4	581.5	90.9	22.6	17.3	61.5
Tugboats	10.6	48.1	136.2	0.1	5.6	4.5	6.6
Total	**381.94**	**911.44**	**10,527.84**	**338.05**	**177.41**	**141.11**	**235.37**

Total Emissions per Delivery (lb/visit) - Existing

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	264.2	619.6	7,537.8	188.9	113.9	91.1	128.0
Ships - AQMD to 20 mile x 2	35.6	84.0	1,022.6	26.0	15.6	12.4	17.6
Ships - 20 mile to PZ x 2	31.2	73.5	895.1	22.7	13.6	10.9	15.4
Ships - PZ x 4	15.1	35.9	443.7	11.7	6.9	5.5	7.8
Ships - Harbor Transit Inbound x 2	9.5	14.6	100.1	2.6	2.2	1.7	1.7
Ships - Harbor Transit Outbound x 2	4.0	9.3	92.9	2.8	1.6	1.3	1.9
Ships - Turning x 2	4.1	5.0	36.1	0.8	0.8	0.7	0.6
Ships - Docking x 2	4.1	5.0	36.1	0.8	0.8	0.7	0.6
Ships - Hoteling	21.9	51.4	581.5	90.9	22.6	17.3	61.5
Ships - Anchorage	100.3	265.4	3,260.0	197.1	73.8	58.1	129.8
Tugboats x 2	21.2	96.2	272.5	0.2	11.3	9.0	13.3
Total	**511.20**	**1,259.88**	**14,278.58**	**544.66**	**263.02**	**208.65**	**378.11**

Emission per Barrel (lb/1000 bbl delivered)

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Project	0.5	1.3	14.6	0.5	0.2	0.2	0.2
Existing	0.7	1.7	19.8	0.8	0.4	0.3	0.4
Delta	(0.2)	(0.5)	(5.2)	(0.3)	(0.1)	(0.1)	(0.1)

Appendix A
Philips 66 Crude Capacity Project
Suezmax Emissions

Total Emissions per Delivery (lb/visit) - Project

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	362.6	849.9	10,339.3	258.7	156.1	124.8	175.3
Ships - AQMD to 20 mile x 2	47.6	112.0	1,364.3	34.6	20.7	16.6	23.4
Ships - 20 mile to PZ x 2	41.7	98.1	1,194.1	30.3	18.1	14.5	20.5
Ships - PZ x 2	10.0	23.8	294.0	7.7	4.5	3.6	5.2
Ships - Harbor Transit Inbound	6.3	9.6	64.9	1.5	1.4	1.1	1.0
Ships - Harbor Transit Outbound	2.6	6.1	60.9	1.8	1.0	0.8	1.2
Ships - Turning	2.8	3.4	24.1	0.5	0.5	0.4	0.3
Ships - Docking	2.8	3.4	24.1	0.5	0.5	0.4	0.3
Ships - Hoteling	33.7	80.2	918.9	130.2	33.4	25.6	88.0
Tugboats	10.6	48.1	136.2	0.1	5.6	4.5	6.6
Total	**520.75**	**1,234.70**	**14,420.66**	**465.88**	**242.04**	**192.50**	**321.83**

Total Emissions per Delivery (lb/visit) - Existing

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Ships - Point Conception to AQMD x 2	362.6	849.9	10,339.3	258.7	156.1	124.8	175.3
Ships - AQMD to 20 mile x 2	47.6	112.0	1,364.3	34.6	20.7	16.6	23.4
Ships - 20 mile to PZ x 2	41.7	98.1	1,194.1	30.3	18.1	14.5	20.5
Ships - PZ x 4	20.0	47.6	588.0	15.4	9.1	7.3	10.4
Ships - Harbor Transit Inbound x 2	12.6	19.2	129.7	3.1	2.8	2.2	2.1
Ships - Harbor Transit Outbound x 2	5.2	12.2	121.7	3.6	2.1	1.6	2.4
Ships - Turning x 2	5.7	6.8	48.1	1.0	1.1	0.9	0.7
Ships - Docking x 2	5.7	6.8	48.1	1.0	1.1	0.9	0.7
Ships - Hoteling	33.7	80.2	918.9	130.2	33.4	25.6	88.0
Ships - Anchorage	120.1	320.0	3,945.8	221.5	86.5	68.3	145.4
Tugboats x 2	21.2	96.2	272.5	0.2	11.3	9.0	13.3
Total	**676.06**	**1,649.14**	**18,970.54**	**699.54**	**342.22**	**271.70**	**481.92**

Emission per Barrel (lb/1000 bbl delivered)

Project Scenario/Activity	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Project	0.5	1.2	14.4	0.5	0.2	0.2	0.3
Existing	0.7	1.6	19.0	0.7	0.3	0.3	0.5
Delta	(0.2)	(0.4)	(4.5)	(0.2)	(0.1)	(0.1)	(0.2)

APPENDIX B

HEALTH RISK ASSESSMENT

This page intentionally left blank.

Phillips 66 Los Angeles Refinery
Carson Plant
CEQA Health Risk Analysis
Crude Oil Storage Capacity Project

August 1, 2013

Prepared for: Phillips 66
Prepared by: Environmental Audit, Inc.
1000 Ortega Way, Suite A
Placentia, CA 92780
714-632-8521

Phillips 66 – Carson Plant
SCAQMD Rule 1401 Analysis
Crude Oil Storage Capacity Project

FACILITY INFORMATION

The Phillips 66 Los Angeles Refinery – Carson Plant (LARC) is located at 1520 East Sepulveda in the City of Carson in the southern portion of Los Angeles County (see Figure 1). The South Coast Air Quality Management District (SCAQMD) identification number for the facility is 171109. Land use at the LARC is designated by the City of Carson as heavy industrial zoning. The LARC is bounded on the north by Sepulveda Boulevard, on the west by Wilmington Avenue, on the south by a branch of the Burlington Northern and Santa Fe Railroad, and on the east by the Alameda rail corridor and Alameda Boulevard. Property to the north of the LARC is occupied by the Tesoro Los Angeles Refinery-Carson Operations (formerly BP Los Angeles Refinery). The western boundary of the LARC property borders the Container Transportation Services shipping and container storage facility. Property across Wilmington Avenue includes a residential neighborhood to the northwest and commercial uses to the southwest. Land uses to the south of the LARC are used as heavy industrial. Land to the south of Lomita Avenue is dominated by port-related activities. Land to the east of Alameda Street is occupied by the Kinder Morgan storage tank farm and the Tesoro Los Angeles Refinery – Wilmington Operations (formerly Shell/Equilon/Texaco Refinery).

INTRODUCTION

The LARC operates bulk crude oil supply storage facilities to handle incoming crude oil supplies from domestic, i.e., primarily via onshore pipelines, and various vessel-delivered sources from the Port of Long Beach at Berth 121.

LARC currently has four existing 320,000 barrel[1] (bbl) (nominal capacity[2]) receiving tanks for crude oil. Crude oils from up to three different sources are segregated using the four existing 320,000 bbl tanks, which limits vessel delivery volumes to Panamax vessels (400,000 bbl capacity). For larger vessels, such as Aframax (720,000 bbl capacity) or Suezmax (1,000,000 bbl capacity), LARC requires two ship calls to unload the full volume of the vessels, resulting in seven to 10 days when the ship remains in the port area. When a ship larger than Panamax calls, LARC accepts delivery of the first portion of the crude oil into the existing tanks then processes the crude oil through LARC to make room in the receiving tanks to accommodate the second discharge from the larger vessel. In order to avoid the extra time and related vessel hoteling emissions, LARC needs more crude oil tankage and capacity to accommodate the larger vessels so they can discharge all crude oil in one call.

Phillips 66 is proposing to increase crude oil storage capacity at the LARC by installing one new 615,000 bbl crude oil tank[3] (Tank 2640) and associated support facilities at the LARC. In addition, the throughput of two existing 320,000 bbl nominal capacity storage tanks (Tanks 510 and 511)

[1] One barrel equals 42 gallons.
[2] Nominal capacity is the physical maximum capacity of the storage tank. Working capacity is less than the physical capacity.
[3] The new crude oil tank would have a nominal (maximum) capacity of 614,656 barrels and a working capacity of 500,141 barrels. Herein the new crude oil storage tank will be referred to as 615,000 barrel capacity storage tanks.

would be increased, therefore the proposed project also includes the construction of geodesic domes on existing crude oil Tanks 510 and 511. The proposed project also includes the construction of one 14,000 bbl water draw surge tank (Tank 2643). In addition, to provide power to the western portion of the LARC, one new electrical substation will be installed. The proposed project would comply with the South Coast Air Quality Management District's (SCAQMD) best available control technology (BACT), as applicable, for control of volatile organic compounds (VOCs) emissions from refinery storage tanks. No changes to refinery processes are included in the proposed project, therefore, the crude throughput rate of the LARC would not change as a result of implementing the proposed project. The addition of crude oil storage capacity streamlines the movement of ships delivering crude oil to the LARC without changing the overall volume of crude oil delivered to the LARC. Therefore, the proposed project would not increase the crude oil throughput of the Refinery, only the crude oil storage capacity.

As part of the CEQA process, Environmental Audit Inc. (EAI) has performed a health risk analysis for the proposed project. EAI has calculated emissions to evaluate the maximum potential impacts of toxic air contaminants (TACs) associated with the proposed project.

Based on information provided by Phillips 66, the proposed project has been modeled as six area sources (four tanks and two fugitive areas) (See Figure 2). TACs in the emissions from the proposed project are regulated by SCAQMD Rule 1401 – New Source Review for Toxic Air Contaminants. The health risks were evaluated using the SCAQMD *Risk Assessment Procedures for Rules 1401 and 212 Version 7.0* (July 2005). The analysis for cancer and non-cancer risks is presented below. The sources are expected to emit nine chemicals listed in Appendix I of the SCAQMD Rule 1401 Guidelines – four are considered carcinogens, eight are considered to have adverse chronic health effects, and four are considered to have adverse acute health effects (See Attachement A).

EMISSION ESTIMATES

The emissions estimates of TACs for tanks are calculated using the U.S. EPA TANKS 4.0.9d emissions model. Fugitive emissions are based on the Method 2 of the *SCAQMD Guide for Fugitive Emissions Calculations* (SCAQMD, 2003). All emissions are based on a hybrid crude oil speciation, including Tank 2643, which is primarily water. Emissions from Tank 2643 are treated as the same crude oil found in the other tanks instead of a diluted crude oil to present a conservative emission estimate. The emission rates for the health risk model are based on annualized emissions. The calculated emissions and hybrid speciation are presented in Attachement B.

HEALTH RISK ASSESSMENT

The California Air Resources Board (CARB) Hotspots Analysis Reporting Program (HARP) model is the most appropriate model for determining the air quality impact from proposed project. The HARP model (CARB, 2005) combines the US EPA Industrial Source Complex dispersion model with a risk calculation model based on the Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003). The dispersion portion of the HARP model provides estimates of source-specific annual and hourly maximum ambient groundlevel concentrations. The risk

calculator in the HARP model estimates the cancer risk, chronic index, and acute index values. The model default values were modified to conform to the SCAQMD Supplement Guidelines for Preparing Risk Assessment for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD, 2005).

The project is modeled as six area sources. The source parameters are listed in Table 1. The locations of the sources were identified based on data provided by Phillips 66 and the Long Beach and Torrance United Stated Geological Survey Quadrangles (see attached Figure 2).

The receptors used in the model include a fenceline receptor grid and a fine receptor grid. The terrain surrounding the LARC is relatively flat; however, terrain variations were included for the receptor networks. The fenceline receptor grid (maximal spacing every 50 meters(m)) were used to determine the maximum concentrations at the property line of the LARC. A fine receptor grid (100 m x 100 m spacing) was used to identify the maximum impact locations. Figure 3 shows all modeled receptors.

All maximum impact locations are verified as credible locations for receptors (i.e., streets, railroad tracks, and waterways are not considered valid receptor locations). The locations of the maximum impacts are then verified for the type of receptor and are reported below. Selected tables from the HARP model are included in Attachment C. The complete output results from the HARP model are on file at the SCAQMD.

TABLE 1

Source Parameters

Name	UTME	UTMN	Release Height (ft)	Width (ft)	Length (ft)
Tank 510	384270	3741030	50	218	218
Tank 511	384170	3741030	50	218	218
Tank 2640	384424	3740995	65	260	260
Tank 2640 Fugitives	384424	3740995	6	260	260
Tank 2643	384405	3741085	51.5	40	44
Tank 2643 Fugitives	384405	3741085	6	40	44

CANCER RISK ANALYSIS

The maximum cancer risk from the proposed project for an exposed individual resident (MEIR) is located 650 meters south of the LARC boundary. The incremental cancer risk is 1.27×10^{-7} or 0.1 cancer cases per one million at the MEIR. Benzene contributes approximately 90.4 percent of the calculated cancer risk at the MEIR. The inhalation pathway accounts for 99.2 percent of the cancer risk. The cancer risk at the MEIR is less than the significance threshold of one cancer case per one

million, therefore, the cancer risk at the MEIR is less than significant. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment C.

The maximum exposed incremental cancer risk at an occupational exposure (MEIW) is located approximately 50 meters west of the LARC boundary. The incremental cancer risk is 1.33×10^{-7} or 0.1cancer cases per one million at the MEIW. Benzene contributes approximately 85.7 percent of the calculated cancer risk at the MEIW. The inhalation pathway accounts for 98.5 percent of the cancer risk. The cancer risk at the MEIW is less than the significance threshold of one cancer case per one million, therefore, the cancer risk at the MEIW is less than significant. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment C.

NON-CANCER RISK ANALYSIS

The maximum chronic hazard index (MCHI) total for the proposed project for the central nervous system is 0.0005. The MCHI is located at the same receptor as the MEIW. Benzene contributes approximately 72.4 percent of the calculated MCHI. The MCHI is less than the significance threshold of 1.0, therefore, the MCHI is less than significant for the proposed project. Detailed contribution by pollutant to the chronic hazard index for the maximum receptor location is presented in Attachment C.

The maximum acute hazard index (MAHI) total for the developmental and reproductive systems is 0.0015. The MAHI is located on the western boundary of the Refinery. Benzene contributes approximately 98.0 percent of the calculated MAHI. The MAHI is less than the significance threshold of 1.0, therefore, the MAHI is less than significant for the proposed project. Detailed contribution by pollutant to the acute hazard index for the maximum receptor location is presented in Attachment C.

CONCLUSIONS

The cancer risk for the TACs emitted from the proposed project is below the significance threshold of 10 cancer cases per one million and chronic and acute hazard indices are below the 1.0 threshold established under CEQA. Therefore, the cancer risk and hazard index thresholds are not expected to be exceeded at any receptor location. No further health risk analyses are required.

Phillips 66 – Carson Plant
SCAQMD Rule 1401 Analysis
Crude Oil Storage Capacity Project

REFERENCES

CARB/OEHHA, 2003. *Air Resources Board Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk,* October 2003.

CARB, 2005. *Hotspots Analysis and Reporting Program* HARP Version 1.4a (Build 23.07.00) and resources, http://www.arb.ca.gov/toxics/harp/downloads.htm.

OEHHA, 2003. *Air Toxics Hot Spots Program Risk Assessment Guideline: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment,* August 2003.

SCAQMD, 2008. *Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory,* June 2008.

SCAQMD, 2005. *Supplemental Guidelines for Preparing Risk Assessment for the Air Toxic "Hot Spot" Information and Assessment Act. 2005.*

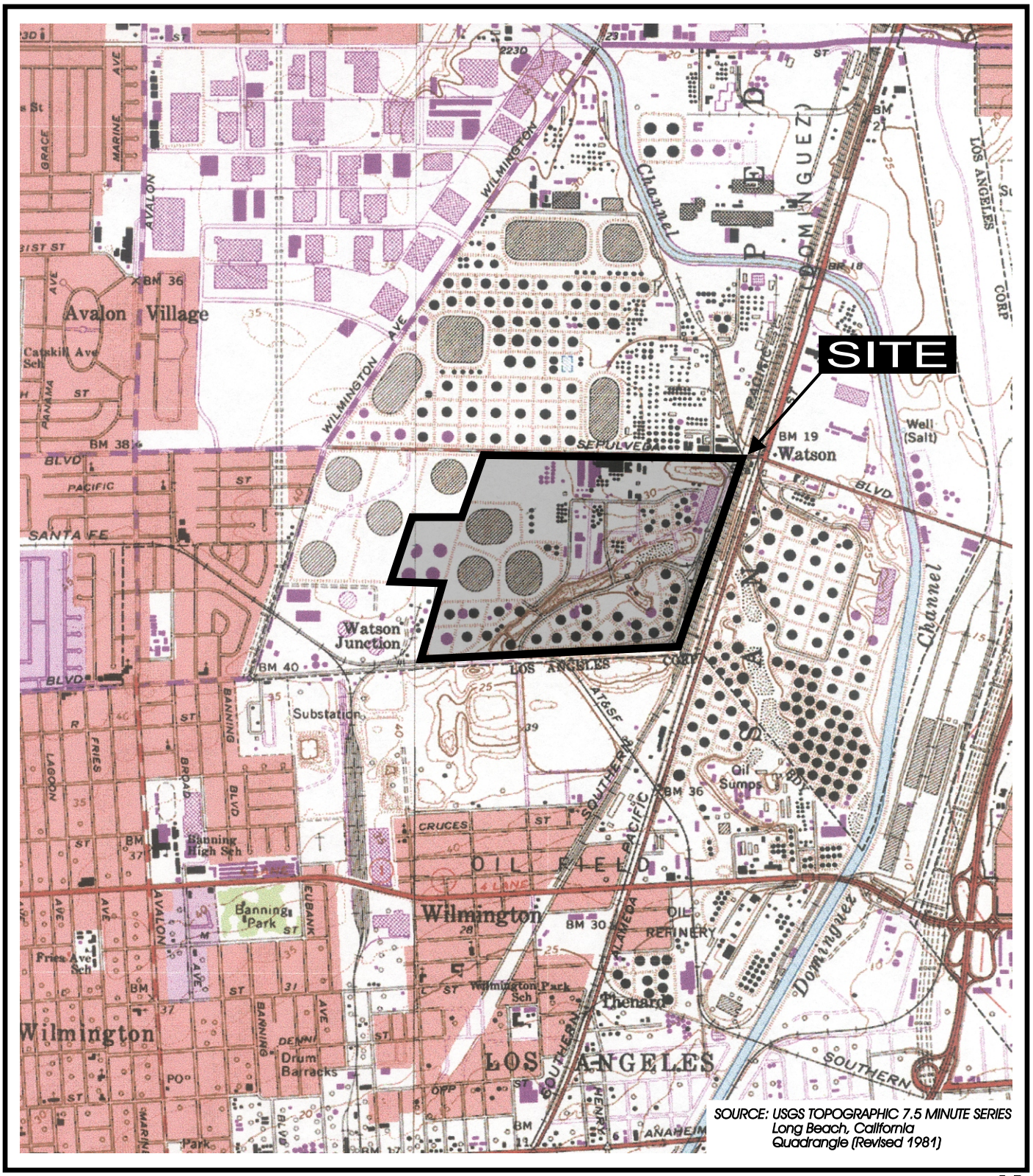
SCAQMD, 2003. *Guide for Fugitive Emissions Calculations. 2003.*

MC/MRB:dab/ss

M:\MC\2778 P66 - Crude Capacity Project\HRA\2788 HRA (rev5).doc

FIGURES

This page intentionally left blank.



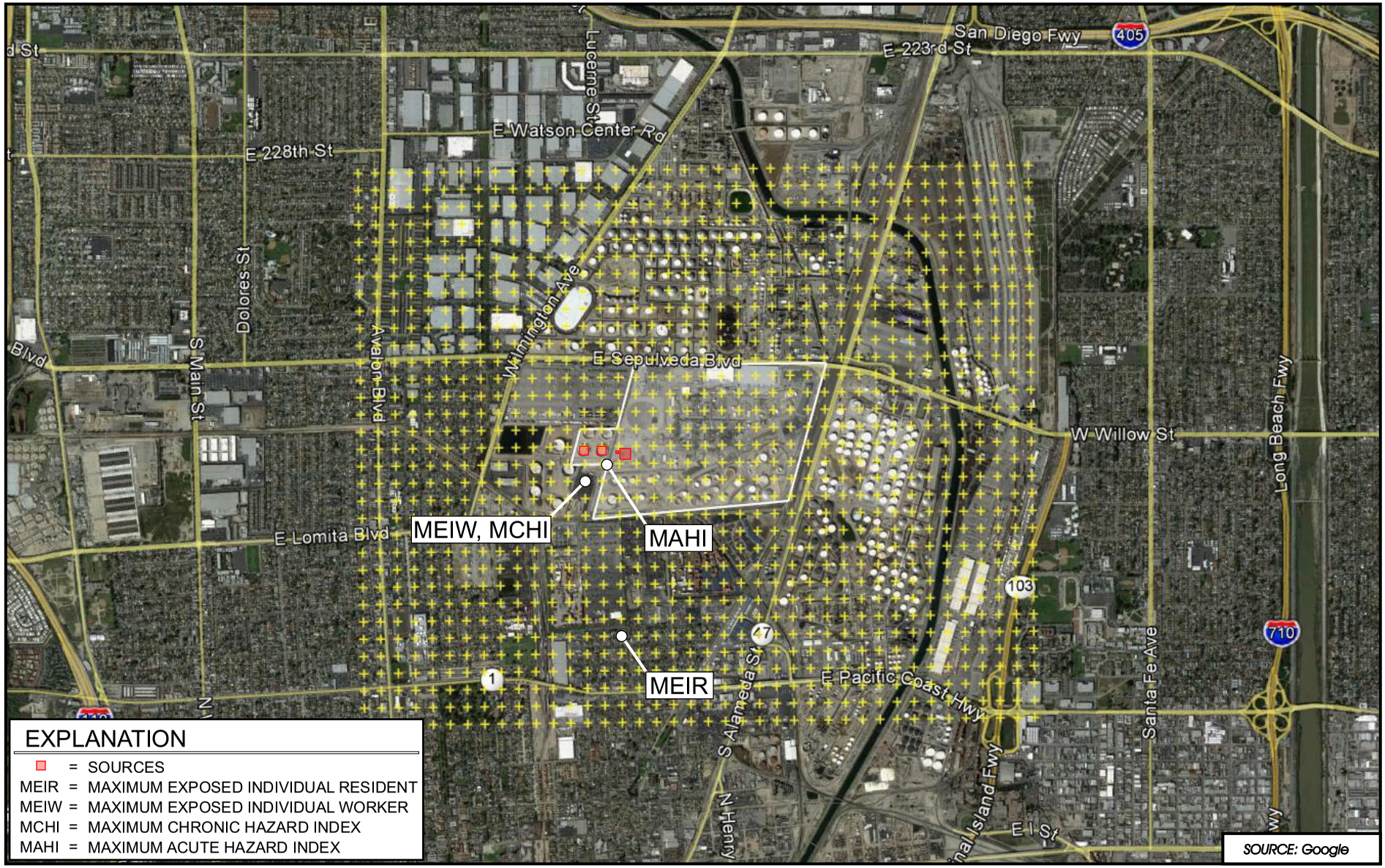
Environmental Audit, Inc.

SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

Figure 1

N:\2778\1401\SiteLocMap (Carson).cdr



ENVIRONMENTAL AUDIT, INC.

MAXIMUM IMPACT LOCATIONS
Phillips 66 Los Angeles Refinery
Carson Plant

Project No. 2778

N:\2778\1401\MaxImpacts (rev.2).cdr

Figure 2

ORIGINAL IN COLOR

Attachment A
Health Risk Tables

This page intentionally left blank.

Attachment A

Health Data

Phillips 66 Carson Plant
Crude Oil Storage Capacity Project

CHEMICAL	CAS NO.	CancerPF (Inhalation) $(mg/kg\text{-}d)^{-1}$	CancerPF (Oral) $(mg/kg\text{-}d)^{-1}$	ChronicREL (Inhalation) $(\mu g/m^3)$	ChronicREL (Oral) (mg/kg-d)	AcuteREL (Inhalation) $(\mu g/m^3)$
Benzene	71432	0.1	*	60	*	1300
Chrysene	218019	3.90E-02	1.20E-01	*	*	*
Cresols	1319773	*	*	600	*	*
Ethyl Benzene	100414	8.70E-03	*	2000	*	*
Hexane	110543	*	*	7000	*	*
Naphthalene	91203	0.12	*	9	*	*
Phenol	108952	*	*	200	*	5800
Toluene	108883	*	*	300	*	37000
Xylenes	1330207	*	*	700	*	22000

PF = Potency Factor

REL = Reference Exposure Limit

Source: SCAQMD, Risk Assessment Proceedures for Rules 1401 and 212, Attachment L, Tables for Applications Deemed Complete on or after July 1, 2005.

This page intentionally left blank.

Attachment B
Emission Calculations

This page intentionally left blank.

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

: Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2640**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	190	0.00	0	-
	SCAQMD Approved I&M Program	Gas / Vapor	0	0	14	4.55	0	63.64
		Light Liquid (4)	0	0	83	4.55	0	377.30
		Heavy Liquid (5)	0	0		4.55	0	-
		> 8 inches	0	0			0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	5	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	2	46.83	0	93.65
Compressors		Gas / Vapor	0	0		9.09	-	-
Flanges (ANSI 16.5-1988)		All	0	0	258	6.99	-	1,803.47
Connectors		All	0	0	134	2.86	-	383.43
Pressure Relief Valves		All	0	0	6	9.09	0	54.54
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	-
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	7	9.09	-	63.63
Total Emissions		lb/year					-	2,840
		lbs/day					0	7.78

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Phillips 66 Carson Plant
Crude Oil Capacity Project

ɜ Component Count

Process Unit: **Philips 66 Carson Plant New Crude Tank 2643**

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All	0	0	61	0.00	0	-
	SCAQMD	Gas / Vapor	0	0	0	4.55	0	-
	Approved	Light Liquid (4)	0	0	16	4.55	0	72.73
	I&M Program	Heavy Liquid (5)	0	0	0	4.55	0	-
		> 8 inches	0	0	0		0	-
Pumps	Sealless Type	Light Liquid (4)	0	0	0	0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)	0	0	0	46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)	0	0	0	46.83	0	-
Compressors		Gas / Vapor	0	0	0	9.09	-	-
Flanges (ANSI 16.5-1988)		All	0	0	79	6.99	-	552.22
Connectors		All	0	0	20	2.86	-	57.23
Pressure Relief Valves		All	0	0	0	9.09	0	-
Process Drains with P-Trap or Seal Pot		All	0	0	0	9.09	-	-
Other (including fittings, hatches, sight-glasses, and meters)		All	0	0	1	9.09	-	9.09
Total Emissions		lb/year					-	691
		lbs/day					0	1.89

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Crude Speciation

Exisitng Crude Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.89	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Canadian Crude Speciation

Component	wt% liquid	ppm liquid	Molecular Weight	Vapor Pressure (mm Hg)	Vapor Pressure (psi)	wt fraction vapor	wt % vapor
Benzene	0.12	1200.00	78.11	95.2	1.8408824	2.02E-04	0.0202
Ethylbenzene	0.041	410.00	106.17	9.53	0.1842816	6.90E-06	0.0007
Hexane	0.96	9600.00	86.18	150	2.90055	2.54E-03	0.2542
Toluene	0.23	2300.00	92.4	28.4	0.5491708	1.15E-04	0.0115
Xylene	0.207	2070.00	106.16	6.72	0.1299446	2.46E-05	0.0025

Hybrid Speciation

Chemical	Crude Liquid Wt%	Crude Vapor Wt%
Benzene	0.14	2.83
PACs (Chrysene)	0.00	0.00
Cresol (mixed isomers)	0.00	0.00
Ethylbenzene	0.15	0.13
n-Hexane	0.96	38.55
Naphthalene	0.09	0.00
Phenol	0.00	0.00
Toluene	0.58	1.01
Xylene (mixed isomers)	0.94	0.19
Cumene	0.00	0.00
Cyclohexane	0.74	19.14
1,2,4-Trimethylbenzene	0.28	0.01

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Fugitive Component Emissions

		Tank 2640			Tank 2643		
Chemical	**Crude Vapor Wt%**	**Emissions lb/yr**	**Emissions lb/day**	**Emissions lb/hr**	**Emissions lb/yr**	**Emissions lb/day**	**Emissions lb/hr**
Benzene	2.83	8.04E+01	0.22	9.18E-03	19.58	0.05	2.24E-03
PACs (Chrysene)	0.00	3.85E-05	0.00	4.39E-09	9.37E-06	0.00	1.07E-09
Cresol (mixed isomers)	0.00	4.63E-05	0.00	5.28E-09	1.13E-05	0.00	1.29E-09
Ethylbenzene	0.13	3.56E+00	0.01	4.06E-04	8.66E-01	0.00	9.89E-05
n-Hexane	38.55	1094.60	3.00	1.25E-01	266.47	0.73	3.04E-02
Naphthalene	0.00	2.45E-02	0.00	2.79E-06	5.95E-03	0.00	6.79E-07
Phenol	0.00	1.10E-04	0.00	1.25E-08	2.67E-05	0.00	3.05E-09
Toluene	1.01	2.87E+01	0.08	3.28E-03	7.00	0.02	7.99E-04
Xylene (mixed isomers)	0.19	5.50E+00	0.02	6.28E-04	1.34E+00	0.00	1.53E-04
Cumene	0.00	7.59E-03	0.00	8.67E-07	0.00	0.00	2.11E-07
Cyclohexane	19.14	543.63	1.49	6.21E-02	132.34	0.36	1.51E-02
1,2,4-Trimethylbenzene	0.01	3.54E-01	0.00	4.04E-05	8.62E-02	0.00	9.84E-06
Total VOC	100.00	2.84E+03	7.78	3.24E-01	691.27	1.89	7.89E-02

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Tank Working Loss Emissions

	Tank 2640[(1)]			Tank 2643[(1)]			Tank R510/R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	8.50	0.0233	9.70E-04	1.68	0.0046	1.92E-04	6.96	0.0191	7.945E-04
PACs (Chrysene)	0.09	0.0002	1.03E-05	0.01	0.0000	1.14E-06	0.07	0.0002	7.991E-06
Cresol (mixed isomers)	0.03	0.0001	3.42E-06	-	-	0.00E+00	0.02	0.0001	2.283E-06
Ethylbenzene	7.12	0.0195	8.13E-04	1.11	0.0030	1.27E-04	5.17	0.0142	5.902E-04
n-Hexane	65.86	0.1804	7.52E-03	14.18	0.0388	1.62E-03	56.90	0.1559	6.495E-03
Naphthalene	4.24	0.0116	4.84E-04	0.64	0.0018	7.31E-05	3.03	0.0083	3.459E-04
Phenol	0.01	0.0000	1.14E-06	-	-	0.00E+00	0.01	0.0000	1.142E-06
Toluene	29.05	0.0796	3.32E-03	4.85	0.0133	5.54E-04	21.79	0.0597	2.487E-03
Xylene (mixed isomers)	44.82	0.1228	5.12E-03	6.99	0.0191	7.97E-04	32.47	0.0890	3.707E-03
Cumene	0.12	0.0003	1.37E-05	0.02	0.0001	2.28E-06	0.08	0.0002	9.132E-06
Cyclohexane	43.84	0.1201	5.00E-03	8.51	0.0233	9.72E-04	35.69	0.0978	4.074E-03
1,2,4-Trimethylbenzene	13.10	0.0359	1.50E-03	2.01	0.0055	2.29E-04	9.39	0.0257	1.072E-03
Total VOC	6,891.78	18.8816	7.87E-01	1,487.19	4.0745	1.70E-01	5963.21	16.3376	6.807E-01

(1) Tank leg emissions scaled for 4" legs.

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Total Tank Operational Emissions

	Tank 2640			Tank 2643		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	88.95	0.2437	0.0102	21.26	0.0583	0.0024
PACs (Chrysene)	0.09	0.0002	0.0000	0.01	0.0000	0.0000
Cresol (mixed isomers)	0.03	0.0001	0.0000	0.00	0.0000	0.0000
Ethylbenzene	10.68	0.0293	0.0012	1.98	0.0054	0.0002
n-Hexane	1,160.47	3.1794	0.1325	280.64	0.7689	0.0320
Naphthalene	4.26	0.0117	0.0005	0.65	0.0018	0.0001
Phenol	0.01	0.0000	0.0000	0.00	0.0000	0.0000
Toluene	57.78	0.1583	0.0066	11.84	0.0324	0.0014
Xylene (mixed isomers)	50.32	0.1379	0.0057	8.32	0.0228	0.0010
Cumene	0.13	0.0003	0.0000	0.02	0.0001	0.0000
Cyclohexane	587.47	1.6095	0.0671	140.85	0.3859	0.0161
1,2,4-Trimethylbenzene	13.45	0.0369	0.0015	2.09	0.0057	0.0002
Total VOC	9,731.43	26.6614	1.1109	2,178.46	5.9684	0.2487

Attachment B
Emissions Calculations

Philips 66 Carson Plant
Tank 510/511 Total Operational Emissions[(1)]

	Existing Tank R510			Project Tank R510			Net Tank R510		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	6.58	0.0180	0.0008	6.96	0.0191	0.0008	0.38	0.0010	4.34E-05
PACs (Chrysene)	0.01	0.0000	0.0000	0.07	0.0002	0.0000	0.06	0.0002	6.85E-06
Cresol (mixed isomers)	-	-	-	0.02	0.0001	0.0000	0.02	0.0001	2.28E-06
Ethylbenzene	1.62	0.0044	0.0002	5.17	0.0142	0.0006	3.55	0.0097	4.05E-04
n-Hexane	63.43	0.1738	0.0072	56.90	0.1559	0.0065	(6.53)	(0.0179)	-7.45E-04
Naphthalene	0.65	0.0018	0.0001	3.03	0.0083	0.0003	2.38	0.0065	2.72E-04
Phenol	-	-	-	0.01	0.0000	0.0000	0.01	0.0000	1.14E-06
Toluene	10.65	0.0292	0.0012	21.79	0.0597	0.0025	11.14	0.0305	1.27E-03
Xylene (mixed isomers)	9.67	0.0265	0.0011	32.47	0.0890	0.0037	22.80	0.0625	2.60E-03
Cumene	0.02	0.0001	0.0000	0.08	0.0002	0.0000	0.06	0.0002	6.85E-06
Cyclohexane	32.60	0.0893	0.0037	35.69	0.0978	0.0041	3.09	0.0085	3.53E-04
1,2,4-Trimethylbenzene	2.19	0.0060	0.0003	9.39	0.0257	0.0011	7.20	0.0197	8.22E-04
Total VOC	2,279.80	6.2460	0.2603	5,963.21	16.3376	0.6807	3,683.41	10.0915	4.20E-01

	Existing Tank R511			Project Tank R511			Net Tank R511		
Chemical	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr	Emissions lb/yr	Emissions lb/day	Emissions lb/hr
Benzene	6.73	0.0184	0.0008	6.96	0.0191	0.0008	0.23	0.0006	2.63E-05
PACs (Chrysene)	0.02	0.0001	0.0000	0.07	0.0002	0.0000	0.05	0.0001	5.71E-06
Cresol (mixed isomers)	-	-	-	0.02	0.0001	0.0000	0.02	0.0001	2.28E-06
Ethylbenzene	1.79	0.0049	0.0002	5.17	0.0142	0.0006	3.38	0.0093	3.86E-04
n-Hexane	64.40	0.1764	0.0074	56.90	0.1559	0.0065	(7.50)	(0.0205)	-8.56E-04
Naphthalene	0.75	0.0021	0.0001	3.03	0.0083	0.0003	2.28	0.0062	2.60E-04
Phenol	-	-	-	0.01	0.0000	0.0000	0.01	0.0000	1.14E-06
Toluene	11.28	0.0309	0.0013	21.79	0.0597	0.0025	10.51	0.0288	1.20E-03
Xylene (mixed isomers)	10.70	0.0293	0.0012	32.47	0.0890	0.0037	21.77	0.0596	2.49E-03
Cumene	0.02	0.0001	0.0000	0.08	0.0002	0.0000	0.06	0.0002	6.85E-06
Cyclohexane	33.41	0.0915	0.0038	35.69	0.0978	0.0041	2.28	0.0062	2.60E-04
1,2,4-Trimethylbenzene	6.73	0.0184	0.0008	9.39	0.0257	0.0011	2.66	0.0073	3.04E-04
Total VOC	2,406.90	6.5942	0.2748	5,963.21	16.3376	0.6807	3,556.31	9.7433	4.06E-01

(1) Existing total VOC emissions based on 2010 throughput values and TANKS 4.0 model.

This page intentionally left blank.

Attachment C

Detailed Risk Tables

This page intentionally left blank.

Attachment C

Maximum Exposed Individual Resident and Contribution

Philips 66 Carson Plant
Crude Oil Storage Capacity Project

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Benzene	1.13E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-07
Chrysene	5.49E-11	7.29E-10	1.09E-10	0.00E+00	0.00E+00	0.00E+00	9.25E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-09	1.82E-09
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	1.40E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-09
Hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	8.60E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.60E-09
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SUM	1.24E-07	7.29E-10	1.09E-10	0.00E+00	0.00E+00	0.00E+00	9.25E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-09	1.25E-07

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Benzene	90.40%	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%	90.40%
Chrysene	0.04%	0.58%	0.09%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.41%	1.46%
Cresols	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%
Ethyl Benzene	1.12%	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%	1.12%
Hexane	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%
Naphthalene	6.88%	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%	6.88%
Phenol	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%
Toluene	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%
Xylenes	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%
SUM	99.20%	0.58%	0.09%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.41%	100.00%

Oral is the combined risk of all non-inhalation pathways.

Attachment C

Maximum Exposed Individual Worker and Contribution

Philips 66 Carson Plant
Crude Oil Storage Capacity Project

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Benzene	1.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-07
Chrysene	1.03E-10	2.37E-09	3.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-09	2.78E-09
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	1.99E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-09
Hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	1.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-08
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SUM	1.31E-07	2.37E-09	3.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-09	1.33E-07

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Benzene	85.71%	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%	85.71%
Chrysene	0.08%	1.78%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.02%	2.09%
Cresols	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%
Ethyl Benzene	1.50%	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%	1.50%
Hexane	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%
Naphthalene	10.68%	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%	10.68%
Phenol	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%
Toluene	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%
Xylenes	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%
SUM	98.50%	1.78%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.02%	100.00%

Oral is the combined risk of all non-inhalation pathways.

Attachment C

Maximum Chronic Hazard Index and Contribution

Philips 66 Carson Plant
Crude Oil Storage Capacity Project

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	CNS
Benzene	0.00E+00	**3.33E-04**	0.00E+00	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	3.33E-04	**72.4%**
Chrysene	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Cresols	0.00E+00	**2.69E-08**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-08	**0.0%**
Ethyl Benzene	0.00E+00	**0.00E+00**	0.00E+00	2.00E-06	2.00E-06	0.00E+00	2.00E-06	0.00E+00	2.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-06	**0.0%**
Hexane	0.00E+00	**3.76E-05**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-05	**8.2%**
Naphthalene	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-04	0.00E+00	0.00E+00	2.30E-04	**0.0%**
Phenol	3.82E-08	**3.82E-08**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-08	0.00E+00	3.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-08	**0.0%**
Toluene	0.00E+00	**5.82E-05**	0.00E+00	5.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.82E-05	0.00E+00	0.00E+00	5.82E-05	**12.7%**
Xylenes	0.00E+00	**3.08E-05**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-05	0.00E+00	0.00E+00	3.08E-05	**6.7%**
SUM	3.82E-08	**4.60E-04**	0.00E+00	3.94E-04	2.00E-06	0.00E+00	2.04E-06	0.00E+00	2.04E-06	0.00E+00	3.19E-04	0.00E+00	3.33E-04	4.60E-04	**100.0%**

Attachment C

Maximum Acute Hazard Index and Contribution

Philips 66 Carson Plant
Crude Oil Storage Capacity Project

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	DEVEL
Benzene	0.00E+00	0.00E+00	0.00E+00	**1.50E-03**	0.00E+00	0.00E+00	0.00E+00	1.50E-03	0.00E+00	**1.50E-03**	0.00E+00	0.00E+00	1.50E-03	1.50E-03	**98.0%**
Chrysene	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Cresols	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Ethyl Benzene	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Hexane	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Naphthalene	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Phenol	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	2.46E-08	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	2.46E-08	0.00E+00	0.00E+00	2.46E-08	**0.0%**
Toluene	0.00E+00	2.52E-05	0.00E+00	**2.52E-05**	0.00E+00	2.52E-05	0.00E+00	0.00E+00	0.00E+00	**2.52E-05**	2.52E-05	0.00E+00	0.00E+00	2.52E-05	**1.6%**
Xylenes	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	2.62E-05	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	2.62E-05	0.00E+00	0.00E+00	2.62E-05	**0.0%**
SUM	0.00E+00	2.52E-05	0.00E+00	**1.53E-03**	0.00E+00	5.14E-05	0.00E+00	1.50E-03	0.00E+00	**1.53E-03**	5.14E-05	0.00E+00	1.50E-03	1.53E-03	**100.0%**

This file: C:\HARP\PROJECTS\2778P665\2778 P66-5 MEIR.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 8/1/2013 2:49:07 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2778P665\2778P665.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method: Derived (Adjusted) Method
Health effect: Cancer Risk
Receptor(s):   1096
Sources(s):   All
Chemicals(s):   All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)   0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

   HUMAN INGESTION
   Fraction of ingested leafy vegetable
     from home grown source   0.052
   Fraction of ingested exposed vegetable
     from home grown source   0.052
   Fraction of ingested protected vegetable
     from home grown source   0.052
   Fraction of ingested root vegetable

from home grown source 0.052

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	71432	Benzene	Benzene	0.000E+00
0002	218019	Chrysene	Chrysene	0.000E+00
0003	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0004	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0005	110543	Hexane	Hexane	0.000E+00
0006	91203	Naphthalene	Naphthalene	0.000E+00
0007	108952	Phenol	Phenol	0.000E+00
0008	108883	Toluene	Toluene	0.000E+00
0009	1330207	Xylenes	Xylenes (mixed)	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0003	1319773	Cresols	*	*	6.00E+02	*	*
0004	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0005	110543	Hexane	*	*	7.00E+03	*	*
0006	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0007	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0008	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0009	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

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

EMISSIONS FOR FACILITY FAC=2778 DEV=1 PRO=1 STK=1 NAME=PHILLIPS66 STACK 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.38	4.337899543378
218019	Chrysene	1	0	0.06	6.849315068493
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.55	4.052511415525

110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.38	2.716894977168
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	11.14	1.271689497716
1330207	Xylenes	1	0	22.8	2.602739726027

EMISSIONS FOR FACILITY FAC=2778 DEV=2 PRO=1 STK=2 NAME=PHILLIPS66 STACK 2 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.23	2.625570776255
218019	Chrysene	1	0	0.05	5.707762557077
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.38	3.858447488584
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.28	2.602739726027
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	10.51	1.199771689497
1330207	Xylenes	1	0	21.77	2.485159817351

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=1 STK=3 NAME=PHILLIPS66 STACK 3 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	8.498888888888	9.701927955352
218019	Chrysene	1	0	0.09	1.027397260273
1319773	Cresols	1	0	0.03	3.424657534246
100414	Ethyl Benzene	1	0	7.118888888888	8.126585489599
110543	Hexane	1	0	65.86222222222	7.518518518518
91203	Naphthalene	1	0	4.24	4.840182648401
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	29.04888888888	3.316083206494
1330207	Xylenes	1	0	44.82	5.116438356164

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=1 STK=5 NAME=PHILLIPS66 STACK 5 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	1.678888888888	1.916539827498
218019	Chrysene	1	0	0.01	1.141552511415
1319773	Cresols	1	0	0	0
100414	Ethyl Benzene	1	0	1.11	1.267123287671
110543	Hexane	1	0	14.17555555555	1.618214104515
91203	Naphthalene	1	0	0.64	7.305936073059
108952	Phenol	1	0	0	0
108883	Toluene	1	0	4.848888888888	5.535261288685
1330207	Xylenes	1	0	6.985555555555	7.974378488077

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=2 STK=6 NAME=PHILLIPS66 STACK 6 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	19.58380139590	2.235593766655
218019	Chrysene	1	0	9.366475360299	1.069232347066
1319773	Cresols	1	0	1.127026849100	1.286560330023
100414	Ethyl Benzene	1	0	0.866365902785	9.890021721297
110543	Hexane	1	0	266.4665569156	3.041855672552
91203	Naphthalene	1	0	5.952168295429	6.794712666015
108952	Phenol	1	0	2.671511936235	3.049671160086
108883	Toluene	1	0	6.995118368536	7.985294941251

1330207	Xylenes	1	0	1.339005007749	1.528544529394

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=2 STK=7 NAME=PHILLIPS66 STACK 7 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	80.44722382500	9.183473039384
218019	Chrysene	1	0	3.847603049727	4.392240924346
1319773	Cresols	1	0	4.629651789941	5.284990627787
100414	Ethyl Benzene	1	0	3.558896982601	4.062667788358
110543	Hexane	1	0	1094.603356759	0.124954721091
91203	Naphthalene	1	0	2.445058573800	2.791162755479
108952	Phenol	1	0	1.097415738348	1.252757692178
108883	Toluene	1	0	28.73486315040	3.280235519453
1330207	Xylenes	1	0	5.500425243474	6.279024250541

CANCER RISK REPORT

DOMINANT PATHWAYS, Receptor 1096

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	A	-	-	-	-	-	-	-	-	-	-	-
0002	-	YES	-	-	-	-	YES	-	-	-	-	-
0003	-	-	-	-	-	-	-	-	-	-	-	-
0004	A	-	-	-	-	-	-	-	-	-	-	-
0005	-	-	-	-	-	-	-	-	-	-	-	-
0006	A	-	-	-	-	-	-	-	-	-	-	-
0007	-	-	-	-	-	-	-	-	-	-	-	-
0008	-	-	-	-	-	-	-	-	-	-	-	-
0009	-	-	-	-	-	-	-	-	-	-	-	-

DERIVED CANCER RISK, RECEPTOR 1096

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	
0001	1.13E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-07		
0002	5.49E-11	7.29E-10	1.09E-10	0.00E+00	0.00E+00	0.00E+00	9.25E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-09	1.82E-09		
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0004	1.40E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-09		
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0006	8.60E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.60E-09		
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
SUM	1.24E-07	7.29E-10	1.09E-10	0.00E+00	0.00E+00	0.00E+00	9.25E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-09	1.25E-07	384400	374

This file: C:\HARP\PROJECTS\2778P665\2778 P66-5 MEIW.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 8/1/2013 2:50:04 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2778P665\2778P665.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\worker pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: Standard work schedule (49 wks/yr, 5 days/wk, 8 hrs/day, 40 yrs)
Analysis method: Point estimate
Health effect: Cancer Risk
Receptor(s):   734
Sources(s):   All
Chemicals(s):   All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)   0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway disabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	71432	Benzene	Benzene	0.000E+00
0002	218019	Chrysene	Chrysene	0.000E+00
0003	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0004	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0005	110543	Hexane	Hexane	0.000E+00
0006	91203	Naphthalene	Naphthalene	0.000E+00
0007	108952	Phenol	Phenol	0.000E+00
0008	108883	Toluene	Toluene	0.000E+00
0009	1330207	Xylenes	Xylenes (mixed)	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0003	1319773	Cresols	*	*	6.00E+02	*	*
0004	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0005	110543	Hexane	*	*	7.00E+03	*	*
0006	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0007	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0008	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0009	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

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

EMISSIONS FOR FACILITY FAC=2778 DEV=1 PRO=1 STK=1 NAME=PHILLIPS66 STACK 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.38	4.337899543378
218019	Chrysene	1	0	0.06	6.849315068493
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.55	4.052511415525
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.38	2.716894977168
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	11.14	1.271689497716
1330207	Xylenes	1	0	22.8	2.602739726027

EMISSIONS FOR FACILITY FAC=2778 DEV=2 PRO=1 STK=2 NAME=PHILLIPS66 STACK 2 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.23	2.625570776255
218019	Chrysene	1	0	0.05	5.707762557077
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.38	3.858447488584
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.28	2.602739726027
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	10.51	1.199771689497
1330207	Xylenes	1	0	21.77	2.485159817351

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=1 STK=3 NAME=PHILLIPS66 STACK 3 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	8.498888888888	9.701927955352
218019	Chrysene	1	0	0.09	1.027397260273
1319773	Cresols	1	0	0.03	3.424657534246
100414	Ethyl Benzene	1	0	7.118888888888	8.126585489599
110543	Hexane	1	0	65.86222222222	7.518518518518
91203	Naphthalene	1	0	4.24	4.840182648401
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	29.04888888888	3.316083206494
1330207	Xylenes	1	0	44.82	5.116438356164

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=1 STK=5 NAME=PHILLIPS66 STACK 5 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	1.678888888888	1.916539827498
218019	Chrysene	1	0	0.01	1.141552511415
1319773	Cresols	1	0	0	0
100414	Ethyl Benzene	1	0	1.11	1.267123287671
110543	Hexane	1	0	14.17555555555	1.618214104515
91203	Naphthalene	1	0	0.64	7.305936073059
108952	Phenol	1	0	0	0
108883	Toluene	1	0	4.848888888888	5.535261288685
1330207	Xylenes	1	0	6.985555555555	7.974378488077

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=2 STK=6 NAME=PHILLIPS66 STACK 6 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	19.58380139590	2.235593766655
218019	Chrysene	1	0	9.366475360299	1.069232347066
1319773	Cresols	1	0	1.127026849100	1.286560330023
100414	Ethyl Benzene	1	0	0.866365902785	9.890021721297
110543	Hexane	1	0	266.4665569156	3.041855672552
91203	Naphthalene	1	0	5.952168295429	6.794712666015
108952	Phenol	1	0	2.671511936235	3.049671160086
108883	Toluene	1	0	6.995118368536	7.985294941251
1330207	Xylenes	1	0	1.339005007749	1.528544529394

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=2 STK=7 NAME=PHILLIPS66 STACK 7 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	80.44722382500	9.183473039384
218019	Chrysene	1	0	3.847603049727	4.392240924346
1319773	Cresols	1	0	4.629651789941	5.284990627787

100414	Ethyl Benzene	1	0	3.558896982601	4.062667788358
110543	Hexane	1	0	1094.603356759	0.124954721091
91203	Naphthalene	1	0	2.445058573800	2.791162755479
108952	Phenol	1	0	1.097415738348	1.252757692178
108883	Toluene	1	0	28.73486315040	3.280235519453
1330207	Xylenes	1	0	5.500425243474	6.279024250541

CANCER RISK REPORT

AVERAGE CANCER RISK, RECEPTOR 734

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	
0001	1.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-07		
0002	1.03E-10	2.37E-09	3.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-09	2.78E-09		
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0004	1.99E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-09		
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0006	1.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-08		
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
SUM	1.31E-07	2.37E-09	3.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-09	1.33E-07	384200	374

This file: C:\HARP\PROJECTS\2778P665\2778 P66-5 MCHI.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 8/1/2013 2:48:38 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2778P665\2778P665.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: resident
Analysis method: Derived (OEHHA) Method
Health effect: Chronic HI
Receptor(s):   734
Sources(s):   All
Chemicals(s):   All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)   0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

   HUMAN INGESTION
   Fraction of ingested leafy vegetable
     from home grown source   0.052
   Fraction of ingested exposed vegetable
     from home grown source   0.052
   Fraction of ingested protected vegetable
     from home grown source   0.052
   Fraction of ingested root vegetable

from home grown source 0.052

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	71432	Benzene	Benzene	0.000E+00
0002	218019	Chrysene	Chrysene	0.000E+00
0003	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0004	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0005	110543	Hexane	Hexane	0.000E+00
0006	91203	Naphthalene	Naphthalene	0.000E+00
0007	108952	Phenol	Phenol	0.000E+00
0008	108883	Toluene	Toluene	0.000E+00
0009	1330207	Xylenes	Xylenes (mixed)	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0003	1319773	Cresols	*	*	6.00E+02	*	*
0004	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0005	110543	Hexane	*	*	7.00E+03	*	*
0006	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0007	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0008	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0009	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

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

EMISSIONS FOR FACILITY FAC=2778 DEV=1 PRO=1 STK=1 NAME=PHILLIPS66 STACK 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.38	4.337899543378
218019	Chrysene	1	0	0.06	6.849315068493
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.55	4.052511415525

110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.38	2.716894977168
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	11.14	1.271689497716
1330207	Xylenes	1	0	22.8	2.602739726027

EMISSIONS FOR FACILITY FAC=2778 DEV=2 PRO=1 STK=2 NAME=PHILLIPS66 STACK 2 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.23	2.625570776255
218019	Chrysene	1	0	0.05	5.707762557077
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.38	3.858447488584
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.28	2.602739726027
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	10.51	1.199771689497
1330207	Xylenes	1	0	21.77	2.485159817351

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=1 STK=3 NAME=PHILLIPS66 STACK 3 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	8.498888888888	9.701927955352
218019	Chrysene	1	0	0.09	1.027397260273
1319773	Cresols	1	0	0.03	3.424657534246
100414	Ethyl Benzene	1	0	7.118888888888	8.126585489599
110543	Hexane	1	0	65.86222222222	7.518518518518
91203	Naphthalene	1	0	4.24	4.840182648401
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	29.04888888888	3.316083206494
1330207	Xylenes	1	0	44.82	5.116438356164

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=1 STK=5 NAME=PHILLIPS66 STACK 5 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	1.678888888888	1.916539827498
218019	Chrysene	1	0	0.01	1.141552511415
1319773	Cresols	1	0	0	0
100414	Ethyl Benzene	1	0	1.11	1.267123287671
110543	Hexane	1	0	14.17555555555	1.618214104515
91203	Naphthalene	1	0	0.64	7.305936073059
108952	Phenol	1	0	0	0
108883	Toluene	1	0	4.848888888888	5.535261288685
1330207	Xylenes	1	0	6.985555555555	7.974378488077

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=2 STK=6 NAME=PHILLIPS66 STACK 6 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	19.58380139590	2.235593766655
218019	Chrysene	1	0	9.366475360299	1.069232347066
1319773	Cresols	1	0	1.127026849100	1.286560330023
100414	Ethyl Benzene	1	0	0.866365902785	9.890021721297
110543	Hexane	1	0	266.4665569156	3.041855672552
91203	Naphthalene	1	0	5.952168295429	6.794712666015
108952	Phenol	1	0	2.671511936235	3.049671160086
108883	Toluene	1	0	6.995118368536	7.985294941251

1330207	Xylenes	1	0	1.339005007749	1.528544529394

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=2 STK=7 NAME=PHILLIPS66 STACK 7 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	80.44722382500	9.183473039384
218019	Chrysene	1	0	3.847603049727	4.392240924346
1319773	Cresols	1	0	4.629651789941	5.284990627787
100414	Ethyl Benzene	1	0	3.558896982601	4.062667788358
110543	Hexane	1	0	1094.603356759	0.124954721091
91203	Naphthalene	1	0	2.445058573800	2.791162755479
108952	Phenol	1	0	1.097415738348	1.252757692178
108883	Toluene	1	0	28.73486315040	3.280235519453
1330207	Xylenes	1	0	5.500425243474	6.279024250541

CHRONIC HI REPORT

DOMINANT PATHWAYS, Receptor 734

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	YES	-	-	-	-	-	-	-	-	-	-	-
0002	YES	YES	-	-	-	-	YES	-	-	-	-	-
0003	YES	-	-	-	-	-	-	-	-	-	-	-
0004	YES	-	-	-	-	-	-	-	-	-	-	-
0005	YES	-	-	-	-	-	-	-	-	-	-	-
0006	YES	-	-	-	-	-	-	-	-	-	-	-
0007	YES	-	-	-	-	-	-	-	-	-	-	-
0008	YES	-	-	-	-	-	-	-	-	-	-	-
0009	YES	-	-	-	-	-	-	-	-	-	-	-

DERIVED CHRONIC HI, RECEPTOR 734

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	UTME	UTMN	ZON
0001	0.00E+00	3.33E-04	0.00E+00	3.33E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-04	3.33E-04			
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0003	0.00E+00	2.69E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-08			
0004	0.00E+00	0.00E+00	0.00E+00	2.00E-06	2.00E-06	0.00E+00	2.00E-06	0.00E+00	2.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-06			
0005	0.00E+00	3.76E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-05			
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-04	0.00E+00	0.00E+00	2.30E-04			
0007	3.82E-08	3.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-08	0.00E+00	3.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-08			
0008	0.00E+00	5.82E-05	0.00E+00	5.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.82E-05	0.00E+00	0.00E+00	5.82E-05			
0009	0.00E+00	3.08E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-05	0.00E+00	0.00E+00	3.08E-05			
SUM	3.82E-08	4.60E-04	0.00E+00	3.94E-04	2.00E-06	0.00E+00	2.04E-06	0.00E+00	2.04E-06	0.00E+00	3.19E-04	0.00E+00	3.33E-04	4.60E-04	384200	3740900	1

This file: C:\HARP\PROJECTS\2778P665\2778 P66-5 MAHI.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 8/1/2013 2:48:12 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2778P665\2778P665.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Analysis method: Point Estimate
Health effect: Acute HI Simple (Concurrent Max.)
Receptor(s):   1328
Sources(s):   All
Chemicals(s):   All

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	71432	Benzene	Benzene	0.000E+00
0002	218019	Chrysene	Chrysene	0.000E+00
0003	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0004	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0005	110543	Hexane	Hexane	0.000E+00
0006	91203	Naphthalene	Naphthalene	0.000E+00
0007	108952	Phenol	Phenol	0.000E+00
0008	108883	Toluene	Toluene	0.000E+00
0009	1330207	Xylenes	Xylenes (mixed)	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0002	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0003	1319773	Cresols	*	*	6.00E+02	*	*
0004	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0005	110543	Hexane	*	*	7.00E+03	*	*
0006	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0007	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0008	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0009	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

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

EMISSIONS FOR FACILITY FAC=2778 DEV=1 PRO=1 STK=1 NAME=PHILLIPS66 STACK 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.38	4.337899543378
218019	Chrysene	1	0	0.06	6.849315068493
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.55	4.052511415525
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.38	2.716894977168
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	11.14	1.271689497716
1330207	Xylenes	1	0	22.8	2.602739726027

EMISSIONS FOR FACILITY FAC=2778 DEV=2 PRO=1 STK=2 NAME=PHILLIPS66 STACK 2 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	0.23	2.625570776255
218019	Chrysene	1	0	0.05	5.707762557077
1319773	Cresols	1	0	0.02	2.283105022831
100414	Ethyl Benzene	1	0	3.38	3.858447488584
110543	Hexane	1	0	0	0
91203	Naphthalene	1	0	2.28	2.602739726027
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	10.51	1.199771689497
1330207	Xylenes	1	0	21.77	2.485159817351

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=1 STK=3 NAME=PHILLIPS66 STACK 3 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	8.498888888888	9.701927955352
218019	Chrysene	1	0	0.09	1.027397260273
1319773	Cresols	1	0	0.03	3.424657534246
100414	Ethyl Benzene	1	0	7.118888888888	8.126585489599
110543	Hexane	1	0	65.86222222222	7.518518518518
91203	Naphthalene	1	0	4.24	4.840182648401
108952	Phenol	1	0	0.01	1.141552511415
108883	Toluene	1	0	29.04888888888	3.316083206494
1330207	Xylenes	1	0	44.82	5.116438356164

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=1 STK=5 NAME=PHILLIPS66 STACK 5 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	1.678888888888	1.916539827498
218019	Chrysene	1	0	0.01	1.141552511415
1319773	Cresols	1	0	0	0
100414	Ethyl Benzene	1	0	1.11	1.267123287671
110543	Hexane	1	0	14.17555555555	1.618214104515
91203	Naphthalene	1	0	0.64	7.305936073059
108952	Phenol	1	0	0	0
108883	Toluene	1	0	4.848888888888	5.535261288685
1330207	Xylenes	1	0	6.985555555555	7.974378488077

EMISSIONS FOR FACILITY FAC=2778 DEV=5 PRO=2 STK=6 NAME=PHILLIPS66 STACK 6 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	19.58380139590	2.235593766655

218019	Chrysene	1	0	9.366475360299	1.069232347066
1319773	Cresols	1	0	1.127026849100	1.286560330023
100414	Ethyl Benzene	1	0	0.866365902785	9.890021721297
110543	Hexane	1	0	266.4665569156	3.041855672552
91203	Naphthalene	1	0	5.952168295429	6.794712666015
108952	Phenol	1	0	2.671511936235	3.049671160086
108883	Toluene	1	0	6.995118368536	7.985294941251
1330207	Xylenes	1	0	1.339005007749	1.528544529394

EMISSIONS FOR FACILITY FAC=2778 DEV=3 PRO=2 STK=7 NAME=PHILLIPS66 STACK 7 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
71432	Benzene	1	0	80.44722382500	9.183473039384
218019	Chrysene	1	0	3.847603049727	4.392240924346
1319773	Cresols	1	0	4.629651789941	5.284990627787
100414	Ethyl Benzene	1	0	3.558896982601	4.062667788358
110543	Hexane	1	0	1094.603356759	0.124954721091
91203	Naphthalene	1	0	2.445058573800	2.791162755479
108952	Phenol	1	0	1.097415738348	1.252757692178
108883	Toluene	1	0	28.73486315040	3.280235519453
1330207	Xylenes	1	0	5.500425243474	6.279024250541

ACUTE HI REPORT

ACUTE HI, RECEPTOR 1328

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	UTME	UTMN	ZON
0001	0.00E+00	0.00E+00	0.00E+00	1.50E-03	0.00E+00	0.00E+00	0.00E+00	1.50E-03	0.00E+00	1.50E-03	0.00E+00	0.00E+00	1.50E-03	1.50E-03			
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0004	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-08	0.00E+00	0.00E+00	2.46E-08			
0008	0.00E+00	2.52E-05	0.00E+00	2.52E-05	0.00E+00	2.52E-05	0.00E+00	0.00E+00	0.00E+00	2.52E-05	2.52E-05	0.00E+00	0.00E+00	2.52E-05			
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E-05	0.00E+00	0.00E+00	2.62E-05			
SUM	0.00E+00	2.52E-05	0.00E+00	1.53E-03	0.00E+00	5.14E-05	0.00E+00	1.50E-03	0.00E+00	1.53E-03	5.14E-05	0.00E+00	1.50E-03	1.53E-03	384333	3740995	1

APPENDIX C

HAZARDS ANALYSIS

QUEST
CONSULTANTS INC.®

July 3, 2013

Ms. Debra Bright Stevens
Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92670-7125

Re: Phillips 66 Tank Fire Calculations

Dear Ms. Stevens:

Phillips 66 is proposing to install one new 615,000 barrel crude storage tank at the Phillips 66 Carson Plant located at 1520 East Sepulveda Boulevard, Carson, California. Phillips 66 is also proposing to increase the throughput of two existing 320,000 barrel nominal capacity storage tanks so the proposed project includes the construction of geodesic domes on existing crude Tanks 510 and 511. The proposed project also includes the construction of a 14,000 barrel water draw surge tank. The new 615,000 barrel tank will be located in an area that already has existing crude storage tanks. The existing and proposed storage tanks are summarized in Table 1. The location of the existing and proposed storage tanks are shown on Figure 1 with the proposed tanks marked with diagonal lines.

Table 1
Storage Tank Parameters

Tank Status	Tank Number(s)	Contents	Tank Diameter (ft)	Tank Wall Height (ft)
Proposed	2640	Crude oil with Reid Vapor Pressure up to 11 psi	260	65
Proposed	2643	Crude oil and water	44	52
Existing	510, 511, 512, 513	Crude oil	218	50

The objective of this study was to compute the potential decrease and/or increase in hazards to the public due to the proposed storage tank additions.

This report details the calculations made to identify the maximum fire radiation hazard zones associated with a tank top fire (pool fire) from any one of the proposed storage tanks. The scenario selected represents the largest, credible releases (i.e., storage tank dome failure) followed by ignition (pool fire) resulting in a large fire.

MAILING: P.O. BOX 721387 NORMAN, OK 73070-8069
SHIPPING: 908 26TH AVENUE NW, SUITE 103 NORMAN, OK 73069
TELEPHONE: (405) 329-7475 FAX: (405) 329-7734
E-mail: info@questconsult.com

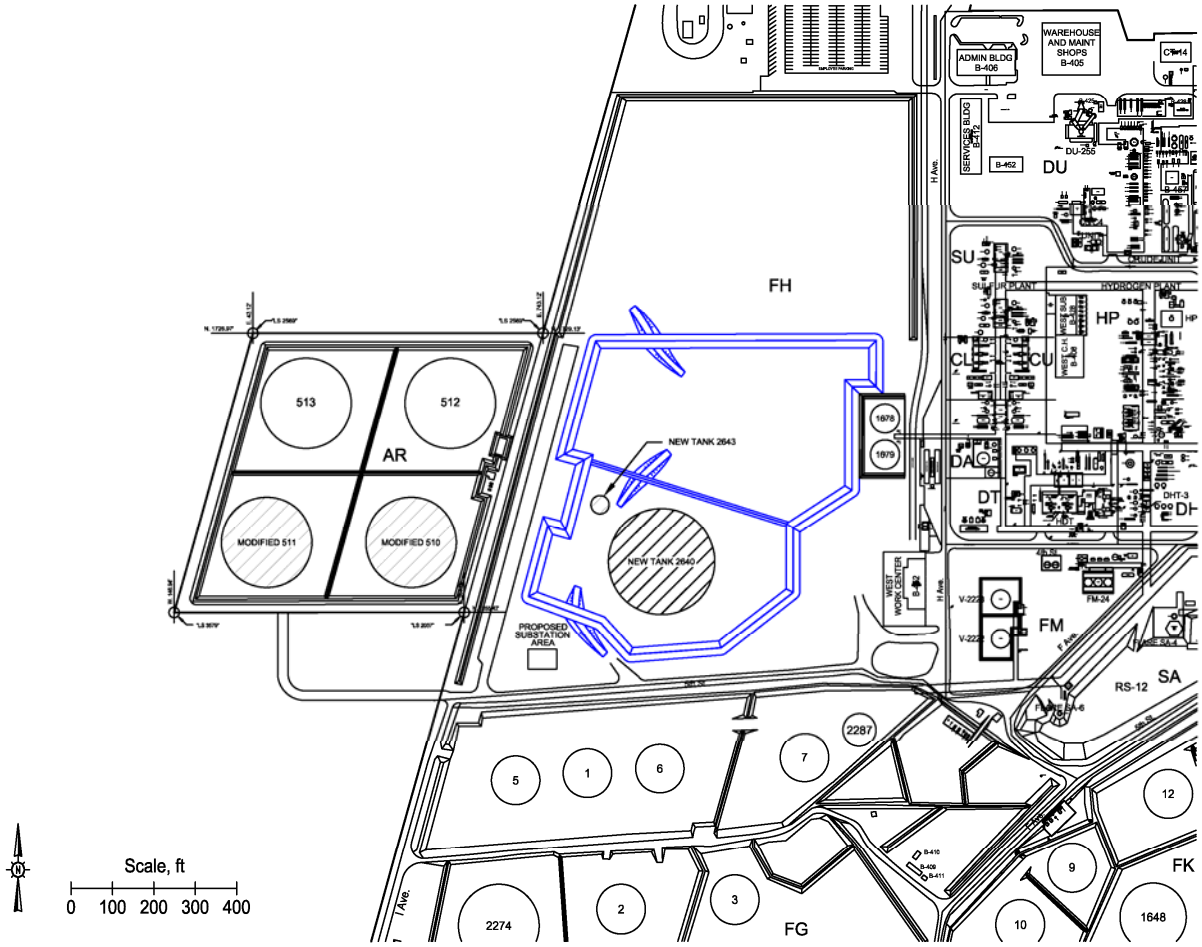


Figure 1
Existing and Proposed Tank Locations

The following atmospheric conditions were employed in the modeling.

Wind speed	= 20 miles/hour (worst case for fires as flame is bent downwind)
Relative humidity	= 70%
Air temperature	= 70°F
Surface temperature	= 70°F

The hazard of interest for pool fires is direct exposure to the flames. Pool fire hazard zones are determined by first calculating the maximum size of the flame column created by the pool fire and then determining how far specific radiant impacts extend from the fire column. For fire radiation hazards, the maximum distance to potentially injurious levels are determined.

The fire radiation hazard endpoint criterion defined in this study corresponds to a hazard level which might cause an injury. Data exist which define an injury level following exposure to fire radiation. Table 2 presents the endpoint hazard criteria used by federal agencies and national associations for this type of analysis.

Table 2
Consequence Analysis Hazard Levels
(Endpoint Criteria for Consequence Analysis)

Hazard Type	Injury Threshold		
	Exposure Duration	Hazard Level	Reference
Radiant heat exposure	40 sec	1,600 Btu/(hr•ft^2) *	40 CFR 68 [EPA, 1996]

40 CFR 68. United States Environmental Protection Agency RMP endpoints.

* Corresponds to second-degree skin burns.

Consequence Analysis

When performing site-specific consequence analysis studies, the ability to accurately model the release, dilution, and dispersion of gases and aerosols is important if an accurate assessment of potential exposure is to be attained. For this reason, Quest uses a modeling package, CANARY by Quest®, that contains a set of complex models that calculate release conditions, initial dilution of the vapor (dependent upon the release characteristics), and the subsequent dispersion of the vapor introduced into the atmosphere. The models contain algorithms that account for thermodynamics, mixture behavior, transient release rates, gas cloud density relative to air, initial velocity of the released gas, and heat transfer effects from the surrounding atmosphere and the substrate. The release and dispersion models contained in the QuestFOCUS package (the predecessor to CANARY by Quest®) were reviewed in a United States Environmental Protection Agency (EPA) sponsored study[1] and an American Petroleum Institute (API) study[2]. In both studies, the QuestFOCUS software was evaluated on technical merit (appropriateness of models for specific applications) and on model predictions for specific releases. One conclusion drawn by both studies was that the dispersion software tended to overpredict the extent of the gas cloud travel, thus resulting in too large a cloud when compared to the test data (i.e., a conservative approach).

A study prepared for the Minerals Management Service[3] reviewed models for use in modeling routine and accidental releases of flammable and toxic gases. CANARY by Quest® received the highest possible ranking in the science and credibility areas. In addition, the report recommends CANARY by Quest® for use when evaluating toxic and flammable gas releases. The specific models contained in the CANARY by Quest® software package have also been extensively reviewed.

[1] *Evaluation of Dense Gas Dispersion Models*. Prepared for the U.S. Environmental Protection Agency by TRC Environmental Consultants Inc., East Hartford, Connecticut, 06108, EPA Contract No. 68-02-4399, May, 1991.

[2] *Hazard Response Modeling Uncertainty (A Quantitative Method)*; *Volume II, Evaluation of Commonly-Used Hazardous Gas Dispersion Models*, S. R. Hanna, D. G. Strimaitis, and J. C. Chang, Study cosponsored by the Air Force Engineerin4g and Services Center, Tyndall Air Force Base, Florida, and the American Petroleum Institute, and performed by Sigma Research Corporation, Westford, Massachusetts, September 1991.

[3] *A Critical Review of Four Types of Air Quality Models Pertinent to MMS Regulatory and Environmental Assessment Missions*, Joseph C. Chang, Mark E. Fernau, Joseph S. Scire, and David G. Strimaitis. Mineral Management Service, Gulf of Mexico OCS Region, U.S. Department of the Interior, New Orleans, November, 1998.

CANARY by Quest® also contains models for pool fire and torch (jet) fire radiation. These models account for material composition, target height relative to the flame, target distance from the flame, atmospheric attenuation (includes humidity), wind speed, and atmospheric temperature. The fire models are based on information in the public domain (published literature) and have been validated with experimental data.

Conclusions

CANARY by Quest® was used to model the potential tank top fire following the failure of the tank dome. Table 3 presents the maximum downwind distances for the pool fire hazard associated with two proposed and four existing storage tanks in the same area of the Phillips 66 refinery. As can be seen from the table, the impact distances can extend up to about 510 feet from the center of the proposed 615,000 barrel tank. This maximum impact distance is larger than the potential hazard zones associated with the nearby existing tanks but the impact distance to 1,600 Btu/(hr•ft^2) does not extend off the refinery property. Thus, the addition of the two proposed storage tanks to this section of the Phillips 66 refinery does not pose any new hazards to areas outside of the existing Refinery.

The results listed in Table 3 are presented in Figure 2. The maximum impact zone distances are shown in Figure 2 for each proposed and existing tank evaluated. The dashed lines around the existing tanks show the area currently potentially exposed to a 1,600 Btu/(hr•ft^2) radiant impact. The dashed lines around the proposed tanks show the area that could be exposed to a 1,600 Btu/(hr•ft^2) radiant impact. As can be seen in Figure 2, neither of the two proposed tanks can produce this impact level outside the refinery property line. The potential radiant impact zones all shown for the four existing tanks (510, 511, 512, and 513) in order to demonstrate the existence of the current potential hazard relative to the potential new hazard associated with tank 2640.

I believe this covers the analysis requested. If you have any questions, please give us a call.

Sincerely,

John B. Cornwell.
Principal Engineer

tml

Table 3
Consequence Modeling Radiation Results

Tank Status	Tank Number(s)	Contents	Tank Diameter (ft)	Tank Wall Height (ft)	Distance (ft) to 1,600 Btu/(hr•ft^2) [measured from center of tank]
Proposed	2640	Hydrocarbon mix with Reid Vapor Pressure up to 11 psi	260	65	510
Proposed	2643	Crude oil and water	44	52	130
Existing	510, 511, 512, 513	Crude oil	218	50	450

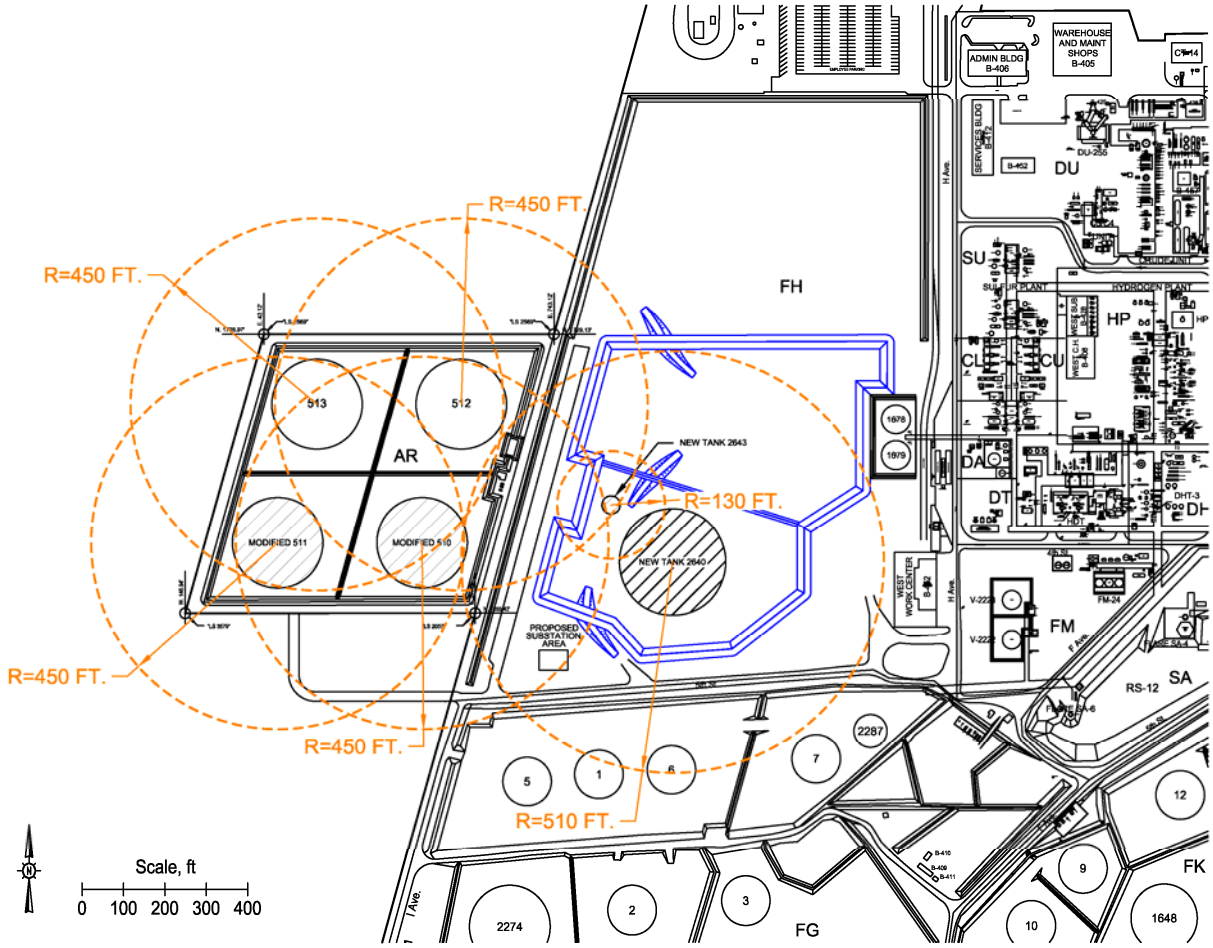


Figure 2
Potential 1,600 Btu/(hr•ft^2) Impact Zones for Existing and Proposed Storage Tanks

APPENDIX D

Adjudicated Water Rights

Table 2 – Water Rights Accounting (acre-feet)

Party ID	Party	Sales [1] 2011-12	Adjudicated Right 2011-12	Carryover from 2010-11	Leases [1]		Allowable Extraction [2]	Amount Pumped	In-Lieu	Balance [3]	Allowable Carryover into 2012-2013		
					With Flex	Without Flex					Drought	Normal	Total
7002	A B C Nursery, Inc		24.10	4.82			28.92	14.80		14.12		4.82	4.82
7003	Allied-Signal, Inc (Torrance)		22.50	4.50			27.00	0.00		27.00		4.50	4.50
7013	Aqua Capital Mangement LP		11.80	2.36	-14.16		0.00	0.00		0.00		0.00	0.00
7015	Asahi Fancy Koi, Inc		2.00	34.20			36.20	0.00		36.20	32.20	2.00	34.20
7025	Atlantic Richfield Company		5,309.00	1,061.80			6,370.80	2,421.94		3,948.86		1,061.80	1,061.80
7028	Automation Industries, Inc		0.70	5.40			6.10	0.00		6.10	3.40	2.00	5.40
7048	CBS, Inc.		9.50	2.00			11.50	0.00		11.50		2.00	2.00
7050	California Water Service Company		4,070.00	814.00			4,884.00	2,185.98		2,698.02		814.00	814.00
7053	California Water Service Company (Dominguez)		10,417.45	2,083.49			12,500.94	5,618.11		6,882.83		2,083.49	2,083.49
7052	California Water Service Company (Hawthorne Lease)		0.00	2.00			2.00	312.79		-310.79		-310.79	-310.79
7065	Carson-Harbor Village Mobile Home Park	-1.20	7.00	2.00			9.00	0.00		9.00		2.00	2.00
7070	Carson-Madrona Company		104.00	20.80			124.80	0.00		124.80		20.80	20.80
7075	Century Builders		4.70	2.00			6.70	0.00		6.70		2.00	2.00
7080	Chandler's Palos Verdes Sand & Gravel Company		294.20	-9.30	-40.00		244.90	266.04		-21.14		-21.14	-21.14
7086	Chevron USA, Inc.		4,601.30	140.00	-3,901.30		840.00	0.00		840.00		140.00	140.00
7089	Coastline Church of Christ		0.70	5.40			6.10	0.00		6.10	3.40	2.00	5.40
7093	Conocophillips Company		6,170.00	2,021.78			8,191.78	4,558.39		3,633.39	787.78	1,234.00	2,021.78
7100	Curtis, Owen W		0.36	4.72			5.08	0.00		5.08	2.72	2.00	4.72
7110	Delaney, Golda Estate of		4.10	12.20			16.30	0.00		16.30	10.20	2.00	12.20
7150	El Segundo, City of		953.00	0.40	-953.00		0.40	0.00		0.40		0.40	0.40
7156	Engelsma, Susan Trust		12.10	2.00	-12.10		2.00	0.00		2.00		2.00	2.00
7165	Evergreen America Corp.		5.40	2.00			7.40	0.00		7.40		2.00	2.00
7201	Fujimoto, S.R., S.T., & J.K.		20.00	16.28			36.28	3.95		32.33	12.28	4.00	16.28
7220	Gillingham, Florence R, et al		2.40	2.00			4.40	0.00		4.40		2.00	2.00
7226	Golden State Water Company		7,502.24	2,387.97	6,101.30		15,991.51	13,434.32		2,557.19	3.39	2,553.80	2,557.19
7260	Hawthorne, City of		1,882.00	376.40			2,258.40	0.00		2,258.40		376.40	376.40
7270	Hillside Memorial Park		92.30	-18.75	44.16		117.71	111.12		6.59		6.59	6.59
7278	Hollywood Park Land Company, LLC		282.00	0.00	-282.00		0.00	0.00		0.00		0.00	0.00
7285	Honold, Kristin Brandsma		11.80	2.36			14.16	0.00		14.16		2.36	2.36
7293	Hughes Aircraft Company		0.00	0.00			0.00	0.00		0.00		0.00	0.00
7310	Inglewood, City of		4,449.89	557.66	-1,748.00		3,259.55	2,475.53		784.02		540.38	540.38
7312	Inglewood Park Cemetery		0.00	2.00			2.00	0.00		2.00		2.00	2.00
7364	Kinder Morgan Liquids Terminals, LLC		167.00	33.40			200.40	4.75		195.65		33.40	33.40
7380	Leuzinger, Emma L Estate of		1.40	6.50			7.90	0.00		7.90	4.50	2.00	6.50
7450	Lomita, City of Water System		1,352.00	70.40	-450.00		972.40	12.81		959.59		180.40	180.40
7390	Long Beach, City of		0.70	2.00			2.70	0.00		2.70		2.00	2.00
7400	Lopes, Frank		3.70	11.40			15.10	0.00		15.10	9.40	2.00	11.40
7410	Los Angeles, City of		1,503.00	300.60			1,803.60	0.00		1,803.60		300.60	300.60
7435	Los Angeles County Recreation Facilities		363.70	72.74			436.44	346.26		90.18		72.74	72.74
7440	Los Angeles County Sanitation District 2		102.00	20.40			122.40	0.03		122.37		20.40	20.40

Source: California Department of Water Resources, Watermaster Service in the West Coast Basin, Los Angeles County, September 2012.
http://www.water.ca.gov/watermaster/sd_documents/west_basin_2012/westcoastbasinwatermasterreport2012.pdf (downloaded July 2, 2013)

APPENDIX E

NOISE IMPACT CALCULATIONS

TABLE E-1

Construction Noise Impact Estimates

Distance from Construction Activities	Estimated Noise Levels (dBA)
50	85
100	79
200	73
400(1)	67
800	61
1,600(2)	55
3,200	49

(1) Distance to closest industrial receptor.
(2) Distance to closest resident (sensitive receptor).

TABLE E-2

Construction Vibration Impact Estimates

Distance from Construction Activities	Construction Equipment Vibration (VdB)				
	Pile Driver	Large Bulldozers	Loaded Trucks	Jackhammer	Small Bulldozer
25	100	87	86	79	58
50	94	81	80	73	52
100	88	75	74	67	46
200	82	69	68	61	40
400	76	63	62	55	34
800	70	57	56	49	28
1,600(1)	64	51	50	43	22
3,200	58	45	44	37	16

(1) Distance to closest resident (sensitive receptor). Note there is no CEQA significance threshold for industrial sources.