Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	70.00	Tank Volume (bbl):	22,000.00
Net Throughput (bbl/yr):	2,000,000	Turnovers Per Year:	85.81
Maximum Pumping Rate (bbl/hr):	916.667		
Shell Height (ft):	40	Maximum Liquid Height (ft):	35
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.66
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Slop Oil**	**January**	**52.16**	**48.84**	**55.48**	**51.78**	**2.2099**	**2.06429**	**2.36369**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0100	0.00900	0.01098	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0153	0.01391	0.01684	78.11	78.11	1.06%	0.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0055	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0119	0.0109	0.0130	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0007	0.0006	0.0008	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0046	0.0042	0.0051	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**February**	**49.51**	**46.13**	**52.89**	**49.00**	**2.0930**	**1.95110**	**2.24309**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0092	0.00829	0.01017	114.23	114.23	2.00%	0.63%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0142	0.01284	0.01564	78.11	78.11	1.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0047	0.0042	0.0052	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	0.0009	0.0011	106.17	106.17	1.25%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0111	0.0101	0.0121	86.18	86.18	0.55%	0.57%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0005	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0042	0.0038	0.0047	92.14	92.14	1.38%	0.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**March**	**55.75**	**51.33**	**60.17**	**54.98**	**2.3767**	**2.17261**	**2.59593**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0111	0.00971	0.01259	114.23	114.23	2.00%	0.66%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0170	0.01495	0.01920	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0056	0.0049	0.0063	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0015	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0131	0.0116	0.0147	86.18	86.18	0.55%	0.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0006	0.0009	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0052	0.0045	0.0060	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**April**	**64.03**	**58.52**	**69.54**	**62.87**	**2.8002**	**2.51215**	**3.11423**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.01200	0.01639	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0214	0.01834	0.02476	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0060	0.0081	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0141	0.0187	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	0.0057	0.0079	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**May**	**63.64**	**58.55**	**68.73**	**62.40**	**2.7790**	**2.51378**	**3.06621**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0139	0.01201	0.01603	114.23	114.23	2.00%	0.71%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0211	0.01836	0.02423	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	0.0060	0.0079	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0161	0.0141	0.0183	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0012	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0066	0.0057	0.0077	92.14	92.14	1.38%	0.27%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Mixture/Product	**Slop Oil**	**June**	**72.52**	**65.59**	**79.45**	**70.94**	**3.2954**	**2.88653**	**3.74950**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0178	0.01469	0.02141	114.23	114.23	2.00%	0.77%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0268	0.02227	0.03201	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0087	0.0073	0.0104	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0018	0.0028	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0201	0.0169	0.0238	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0018	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0087	0.0070	0.0106	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**July**	**73.92**	**66.90**	**80.94**	**72.37**	**3.3835**	**2.96032**	**3.85366**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0185	0.01523	0.02226	114.23	114.23	2.00%	0.78%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0278	0.02307	0.03324	78.11	78.11	1.06%	0.80%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0090	0.0075	0.0108	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	0.0019	0.0029	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0208	0.0175	0.0246	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0015	0.0012	0.0019	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0090	0.0073	0.0110	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0010	0.0008	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**August**	**76.37**	**69.59**	**83.15**	**75.01**	**3.5420**	**3.11747**	**4.01152**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0197	0.01642	0.02358	114.23	114.23	2.00%	0.80%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0296	0.02479	0.03513	78.11	78.11	1.06%	0.815754%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0096	0.0081	0.0114	84.16	84.16	0.36%	0.285170%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0025	0.0020	0.0031	106.17	106.17	1.25%	0.095080%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0221	0.0187	0.0259	86.18	86.18	0.55%	0.671657%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0016	0.0013	0.0020	120.19	120.19	1.88%	0.068575%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0097	0.0079	0.0117	92.14	92.14	1.38%	0.314588%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0011	0.0008	0.0013	106.17	106.17	0.75%	0.039802%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**September**	**71.43**	**65.14**	**77.72**	**70.36**	**3.2282**	**2.86142**	**3.63172**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0173	0.01450	0.02045	114.23	114.23	2.00%	0.76%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0260	0.02201	0.03063	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0085	0.0072	0.0099	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0017	0.0027	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0196	0.0167	0.0228	86.18	86.18	0.55%	0.65%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0017	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0084	0.0069	0.0101	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0011	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**October**	**64.24**	**57.63**	**70.85**	**63.43**	**2.8117**	**2.46777**	**3.19311**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.01169	0.01699	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0215	0.01789	0.02563	78.11	78.11	1.06%	0.75%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0059	0.0083	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0013	0.0021	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0138	0.0193	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0068	0.0055	0.0082	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0009	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**November**	**56.72**	**51.74**	**61.70**	**56.23**	**2.4234**	**2.19098**	**2.67537**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0114	0.00983	0.01315	114.23	114.23	2.00%	0.67%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0174	0.01513	0.02003	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0057	0.0050	0.0066	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0016	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0134	0.0118	0.0153	86.18	86.18	0.55%	0.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0007	0.0010	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0053	0.0046	0.0062	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**December**	**51.48**	**48.73**	**54.23**	**51.20**	**2.1794**	**2.05963**	**2.30476**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0098	0.00897	0.01058	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0150	0.01387	0.01625	78.11	78.11	1.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0053	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0117	0.0108	0.0126	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0006	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0045	0.0041	0.0049	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**1,200.8445**	**1,070.3300**	**1,670.6714**	**2,230.2961**	**2,116.8992**	**3,125.9077**	**3,335.4397**	**3,326.9412**	**2,799.1189**	**2,775.8945**	**1,843.6924**	**986.3901**	**26,482.4256**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0322	0.0306	0.0343	0.0398	0.0395	0.0460	0.0471	0.0491	0.0452	0.0399	0.0350	0.0318		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0498	0.0497	0.0686	0.0926	0.0851	0.1275	0.1314	0.1305	0.1143	0.1114	0.0779	0.0410		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.2647	0.2754	0.2508	0.2212	0.2225	0.1944	0.1903	0.1834	0.1977	0.2205	0.2471	0.2674		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0322**	**0.0306**	**0.0343**	**0.0398**	**0.0395**	**0.0460**	**0.0471**	**0.0491**	**0.0452**	**0.0399**	**0.0350**	**0.0318**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.20	509.68	516.19	524.85	524.56	533.76	535.13	537.40	532.18	524.73	516.88	511.44		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0498**	**0.0497**	**0.0686**	**0.0926**	**0.0851**	**0.1275**	**0.1314**	**0.1305**	**0.1143**	**0.1114**	**0.0779**	**0.0410**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.27	13.53	17.69	22.04	20.35	27.71	28.09	27.10	25.15	26.46	19.92	10.99		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.30	0.29	0.42	0.60	0.55	0.86	0.89	0.89	0.77	0.73	0.48	0.25		Calculated Using Equation 1-9
ΔP_R	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	2.0643	1.9511	2.1726	2.5122	2.5138	2.8865	2.9603	3.1175	2.8614	2.4678	2.1910	2.0596		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	2.3637	2.2431	2.5959	3.1142	3.0662	3.7495	3.8537	4.0115	3.6317	3.1931	2.6754	2.3048		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.51	505.80	511.00	518.19	518.22	525.26	526.57	529.26	524.81	517.30	511.41	508.40		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.15	512.56	519.84	529.21	528.40	539.12	540.61	542.82	537.39	530.52	521.37	513.90		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.2647**	**0.2754**	**0.2508**	**0.2212**	**0.2225**	**0.1944**	**0.1903**	**0.1834**	**0.1977**	**0.2205**	**0.2471**	**0.2674**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**15,835.5488**	**13,613.2871**	**16,898.8906**	**18,950.3672**	**19,444.4727**	**21,929.5938**	**23,206.2051**	**24,191.1426**	**21,545.7793**	**19,666.6719**	**16,653.3770**	**15,640.4121**	**227,575.7480**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	7,134,247	6,443,836	7,134,247	6,904,110	7,134,247	6,904,110	7,134,247	7,134,247	6,904,110	7,134,247	6,904,110	7,134,247		Specified monthly throughput
N	Annual Turnovers	85.81	85.81	85.81	85.81	85.81	85.81	85.81	85.81	85.81	85.81	85.81	85.81		Calculated Using Equation 1-36
K_N	Turnover Factor	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163	0.5163		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**17,036.393**	**14,683.617**	**18,569.562**	**21,180.663**	**21,561.372**	**25,055.501**	**26,541.645**	**27,518.084**	**24,344.898**	**22,442.566**	**18,497.069**	**16,626.802**	**254,058.174**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	17,036.393	14,683.617	18,569.562	21,180.663	21,561.372	25,055.501	26,541.645	27,518.084	24,344.898	22,442.566	18,497.069	16,626.802	254,058.174	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	388.368	326.669	437.267	536.082	543.908	680.443	728.987	770.718	655.318	569.035	439.340	376.680	6,452.814	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	115.280	97.158	129.443	157.682	160.033	198.802	212.745	224.480	191.629	167.348	129.960	111.868	1,896.429	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	40.921	34.551	45.837	55.538	56.379	69.656	74.479	78.473	67.186	58.934	45.990	39.728	667.672	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	11.346	9.374	13.082	16.908	17.114	22.590	24.400	26.164	21.616	17.971	13.228	10.954	204.748	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	98.81	83.67	110.25	132.42	134.49	164.67	175.84	184.83	159.01	140.49	110.50	96.00	1,590.98	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/month)	109.535	92.040	123.486	151.783	153.982	193.066	206.902	218.855	185.891	161.122	124.112	106.212	1,826.984	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	7.6865	6.3031	8.9511	11.8262	11.9577	16.1413	17.4946	18.8706	15.4045	12.5763	9.0747	7.4070	143.6935	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	41.07	34.30	46.69	58.47	59.26	75.75	81.42	86.57	72.76	62.09	47.03	39.77	705.18	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	4.64	3.82	5.37	6.99	7.08	9.42	10.19	10.95	9.01	7.43	5.43	4.47	84.80	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**165.66400**	**157.71545**	**176.92450**	**205.15733**	**203.75417**	**237.59001**	**243.29536**	**253.53116**	**233.21944**	**205.91580**	**180.06662**	**163.59534**	**253.53116**	TCEQ APDG 6250 - Equation 1
M_v	Vapor Molecular Weight (lb/lb-mole)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.20990	2.09298	2.37667	2.80020	2.77897	3.29544	3.38345	3.54199	3.22820	2.81168	2.42343	2.17941		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**165.664**	**157.715**	**176.924**	**205.157**	**203.754**	**237.590**	**243.295**	**253.531**	**233.219**	**205.916**	**180.067**	**163.595**	**253.531**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	165.664	157.715	176.924	205.157	203.754	237.590	243.295	253.531	233.219	205.916	180.067	163.595	253.531	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	3.777	3.509	4.166	5.193	5.140	6.452	6.682	7.101	6.278	5.221	4.277	3.706	7.101	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	1.121	1.044	1.233	1.527	1.512	1.885	1.950	2.068	1.836	1.535	1.265	1.101	2.068	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.398	0.371	0.437	0.538	0.533	0.661	0.683	0.723	0.644	0.541	0.448	0.391	0.723	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.110	0.101	0.125	0.164	0.162	0.214	0.224	0.241	0.207	0.165	0.129	0.108	0.241	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.96	0.90	1.05	1.28	1.27	1.56	1.61	1.70	1.52	1.29	1.08	0.94	1.70	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/hr)	1.065	0.989	1.177	1.470	1.455	1.831	1.897	2.016	1.781	1.478	1.208	1.045	2.016	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.07474	0.06770	0.08528	0.11455	0.11300	0.15306	0.16036	0.17386	0.14757	0.11539	0.08834	0.07288	0.17386	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.40	0.37	0.44	0.57	0.56	0.72	0.75	0.80	0.70	0.57	0.46	0.39	0.80	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.09	0.10	0.09	0.07	0.05	0.04	0.10	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -432 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	60,000.00
Net Throughput (bbl/yr):	550,241	Turnovers Per Year:	8.76
Maximum Pumping Rate (bbl/hr):	3,369.202		
Shell Height (ft):	48	Maximum Liquid Height (ft):	45.9
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.13
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{v_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**January**	**52.17**	**48.91**	**55.43**	**51.78**	**3.0924**	**2.88403**	**3.31294**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.00011	0.00015	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0056	0.00504	0.00613	114.23	114.23	1.46%	0.30%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0098	0.0089	0.0107	78.11	78.11	0.88%	0.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0067	0.0061	0.0073	84.16	84.16	0.62%	0.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	0.0007	0.0008	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0181	0.0166	0.0198	86.18	86.18	1.09%	0.74%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0115	0.0103	0.0127	92.14	92.14	4.44%	0.50%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0010	0.0008	0.0011	106.17	106.17	1.62%	0.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	0.0005	0.0006	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0010	0.0009	0.0012	106.17	106.17	1.61%	0.05%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**February**	**49.53**	**46.20**	**52.86**	**49.00**	**2.9230**	**2.71990**	**3.13832**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.00010	0.00013	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0051	0.00464	0.00568	114.23	114.23	1.46%	0.30%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0090	0.0082	0.0099	78.11	78.11	0.88%	0.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0062	0.0056	0.0068	84.16	84.16	0.62%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	0.0006	0.0008	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0169	0.0154	0.0185	86.18	86.18	1.09%	0.73%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0105	0.0094	0.0117	92.14	92.14	4.44%	0.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0009	0.0008	0.0010	106.17	106.17	1.62%	0.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	0.0004	0.0005	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0009	0.0008	0.0011	106.17	106.17	1.61%	0.05%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**March**	**55.78**	**51.41**	**60.15**	**54.98**	**3.3370**	**3.04296**	**3.65376**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.00013	0.00018	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0062	0.00543	0.00703	114.23	114.23	1.46%	0.31%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0108	0.0095	0.0122	78.11	78.11	0.88%	0.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0074	0.0065	0.0083	84.16	84.16	0.62%	0.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	0.0007	0.0010	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0200	0.0178	0.0224	86.18	86.18	1.09%	0.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0129	0.0112	0.0148	92.14	92.14	4.44%	0.52%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0011	0.0009	0.0013	106.17	106.17	1.62%	0.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0006	0.0005	0.0007	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0012	0.0010	0.0014	106.17	106.17	1.61%	0.05%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**April**	**64.07**	**58.62**	**69.52**	**62.87**	**3.9586**	**3.53995**	**4.41653**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.00017	0.00026	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0079	0.00672	0.00915	114.23	114.23	1.46%	0.33%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0136	0.0117	0.0158	78.11	78.11	0.88%	0.39%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0092	0.0080	0.0106	84.16	84.16	0.62%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0009	0.0013	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-432 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Hexane (n)						0.0248	0.0215	0.0284	86.18	86.18	1.09%	0.79%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0167	0.0141	0.0196	92.14	92.14	4.44%	0.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0015	0.0012	0.0018	106.17	106.17	1.62%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0008	0.0007	0.0010	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0016	0.0013	0.0019	106.17	106.17	1.61%	0.06%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**May**	**63.69**	**58.64**	**68.74**	**62.40**	**3.9282**	**3.54196**	**4.34790**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.00017	0.00025	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0078	0.00673	0.00895	114.23	114.23	1.46%	0.33%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0135	0.0117	0.0154	78.11	78.11	0.88%	0.39%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0091	0.0080	0.0104	84.16	84.16	0.62%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0009	0.0013	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0245	0.0215	0.0279	86.18	86.18	1.09%	0.79%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0165	0.0141	0.0192	92.14	92.14	4.44%	0.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0014	0.0012	0.0017	106.17	106.17	1.62%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0008	0.0007	0.0010	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0015	0.0013	0.0018	106.17	106.17	1.61%	0.06%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**June**	**72.58**	**65.72**	**79.44**	**70.94**	**4.6913**	**4.09245**	**5.35904**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0003	0.00022	0.00038	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0099	0.00823	0.01196	114.23	114.23	1.46%	0.36%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0171	0.0142	0.0204	78.11	78.11	0.88%	0.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0115	0.0096	0.0137	84.16	84.16	0.62%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0015	0.0012	0.0019	106.17	106.17	1.09%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0307	0.0258	0.0362	86.18	86.18	1.09%	0.83%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0215	0.0175	0.0262	92.14	92.14	4.44%	0.62%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0019	0.0015	0.0024	106.17	106.17	1.62%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0011	0.0009	0.0014	106.17	106.17	1.13%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0021	0.0017	0.0026	106.17	106.17	1.61%	0.07%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**July**	**73.98**	**67.03**	**80.94**	**72.37**	**4.8217**	**4.20165**	**5.51364**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0003	0.00024	0.00040	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0103	0.00854	0.01243	114.23	114.23	1.46%	0.36%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0177	0.0147	0.0212	78.11	78.11	0.88%	0.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0119	0.0100	0.0142	84.16	84.16	0.62%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0016	0.0012	0.0020	106.17	106.17	1.09%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0317	0.0267	0.0375	86.18	86.18	1.09%	0.83%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0224	0.0182	0.0273	92.14	92.14	4.44%	0.63%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0020	0.0016	0.0026	106.17	106.17	1.62%	0.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0011	0.0009	0.0014	106.17	106.17	1.13%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0022	0.0017	0.0027	106.17	106.17	1.61%	0.07%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**August**	**76.42**	**69.72**	**83.12**	**75.01**	**5.0559**	**4.43349**	**5.74712**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0003	0.00026	0.00043	120.19	120.19	1.14%	0.011753%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0110	0.00920	0.01316	114.23	114.23	1.46%	0.366622%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0189	0.0158	0.0224	78.11	78.11	0.88%	0.428506%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0127	0.0107	0.0150	84.16	84.16	0.62%	0.310690%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0021	106.17	106.17	1.09%	0.052239%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0337	0.0286	0.0395	86.18	86.18	1.09%	0.844031%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.003889%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.000348%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0240	0.0197	0.0290	92.14	92.14	4.44%	0.643413%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0022	0.0018	0.0027	106.17	106.17	1.62%	0.068216%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0012	0.0010	0.0015	106.17	106.17	1.13%	0.038101%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0024	0.0019	0.0029	106.17	106.17	1.61%	0.072665%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**September**	**71.48**	**65.27**	**77.69**	**70.36**	**4.5908**	**4.05591**	**5.18143**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0003	0.00022	0.00035	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0097	0.00813	0.01141	114.23	114.23	1.46%	0.35%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0166	0.0141	0.0195	78.11	78.11	0.88%	0.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0112	0.0095	0.0131	84.16	84.16	0.62%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	0.0012	0.0018	106.17	106.17	1.09%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0298	0.0255	0.0347	86.18	86.18	1.09%	0.82%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0208	0.0173	0.0249	92.14	92.14	4.44%	0.61%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0019	0.0015	0.0023	106.17	106.17	1.62%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0010	0.0008	0.0013	106.17	106.17	1.13%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0020	0.0016	0.0025	106.17	106.17	1.61%	0.07%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**October**	**64.28**	**57.77**	**70.79**	**63.43**	**3.9755**	**3.47826**	**4.52888**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.00016	0.00027	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0079	0.00656	0.00948	114.23	114.23	1.46%	0.33%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0137	0.0114	0.0163	78.11	78.11	0.88%	0.40%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0093	0.0078	0.0110	84.16	84.16	0.62%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0009	0.0014	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0249	0.0210	0.0293	86.18	86.18	1.09%	0.79%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-432 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0168	0.0137	0.0204	92.14	92.14	4.44%	0.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0015	0.0012	0.0018	106.17	106.17	1.62%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0008	0.0006	0.0010	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0016	0.0013	0.0020	106.17	106.17	1.61%	0.06%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**November**	**56.74**	**51.84**	**61.64**	**56.23**	**3.4046**	**3.07107**	**3.76707**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.00013	0.00019	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0064	0.00551	0.00733	114.23	114.23	1.46%	0.31%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0111	0.0097	0.0127	78.11	78.11	0.88%	0.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0076	0.0066	0.0086	84.16	84.16	0.62%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0009	0.0007	0.0010	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0205	0.0180	0.0233	86.18	86.18	1.09%	0.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0133	0.0113	0.0155	92.14	92.14	4.44%	0.53%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0011	0.0009	0.0013	106.17	106.17	1.62%	0.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0006	0.0005	0.0007	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0012	0.0010	0.0014	106.17	106.17	1.61%	0.06%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**UDS 440 - 5 GP SPL BTMS**	**December**	**51.50**	**48.80**	**54.20**	**51.20**	**3.0487**	**2.87739**	**3.22821**	**92.00**	**68.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 7.4 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.00011	0.00014	120.19	120.19	1.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0054	0.00502	0.00591	114.23	114.23	1.46%	0.30%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0096	0.0088	0.0103	78.11	78.11	0.88%	0.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0065	0.0061	0.0071	84.16	84.16	0.62%	0.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	0.0007	0.0008	106.17	106.17	1.09%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0178	0.0165	0.0191	86.18	86.18	1.09%	0.74%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.17%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.27%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0112	0.0103	0.0122	92.14	92.14	4.44%	0.50%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0009	0.0008	0.0010	106.17	106.17	1.62%	0.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	0.0005	0.0006	106.17	106.17	1.13%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0010	0.0009	0.0011	106.17	106.17	1.61%	0.05%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-432 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**2,872.7310**	**2,548.7661**	**4,055.5488**	**5,583.0000**	**5,303.6909**	**8,127.1445**	**8,727.6641**	**8,803.4883**	**7,213.9019**	**6,918.0586**	**4,467.1655**	**2,354.2507**	**66,975.4104**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0383	0.0363	0.0410	0.0478	0.0474	0.0557	0.0571	0.0596	0.0547	0.0480	0.0417	0.0378		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0624	0.0616	0.0875	0.1230	0.1132	0.1778	0.1845	0.1858	0.1578	0.1474	0.0994	0.0512		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.1895	0.1983	0.1781	0.1545	0.1555	0.1336	0.1304	0.1251	0.1361	0.1539	0.1752	0.1917		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45	204,923.45		Calculated Using Equation 1-3
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.092	26.092	26.092	26.092	26.092	26.092	26.092	26.092	26.092	26.092	26.092	26.092		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	22.95	22.95	22.95	22.95	22.95	22.95	22.95	22.95	22.95	22.95	22.95	22.95		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**	**1.04**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0383**	**0.0363**	**0.0410**	**0.0478**	**0.0474**	**0.0557**	**0.0571**	**0.0596**	**0.0547**	**0.0480**	**0.0417**	**0.0378**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.0924	2.9230	3.3370	3.9586	3.9282	4.6913	4.8217	5.0559	4.5908	3.9755	3.4046	3.0487		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.20	515.45	523.74	523.36	532.25	533.65	536.09	531.15	523.95	516.41	511.17		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.23	509.72	516.25	524.94	524.65	533.88	535.25	537.50	532.27	524.80	516.92	511.46		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0624**	**0.0616**	**0.0875**	**0.1230**	**0.1132**	**0.1778**	**0.1845**	**0.1858**	**0.1578**	**0.1474**	**0.0994**	**0.0512**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.06	13.34	17.47	21.82	20.19	27.46	27.82	26.81	24.84	26.05	19.58	10.81		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.43	0.42	0.61	0.88	0.81	1.27	1.31	1.31	1.13	1.05	0.70	0.35		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.0924	2.9230	3.3370	3.9586	3.9282	4.6913	4.8217	5.0559	4.5908	3.9755	3.4046	3.0487		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	2.8840	2.7199	3.0430	3.5399	3.5420	4.0924	4.2017	4.4335	4.0559	3.4783	3.0711	2.8774		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	3.3129	3.1383	3.6538	4.4165	4.3479	5.3590	5.5136	5.7471	5.1814	4.5289	3.7671	3.2282		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.20	515.45	523.74	523.36	532.25	533.65	536.09	531.15	523.95	516.41	511.17		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.58	505.87	511.08	518.29	518.31	525.39	526.70	529.39	524.94	517.44	511.51	508.47		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.10	512.53	519.82	529.19	528.41	539.11	540.61	542.79	537.36	530.46	521.31	513.87		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.1895**	**0.1983**	**0.1781**	**0.1545**	**0.1555**	**0.1336**	**0.1304**	**0.1251**	**0.1361**	**0.1539**	**0.1752**	**0.1917**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.0924	2.9230	3.3370	3.9586	3.9282	4.6913	4.8217	5.0559	4.5908	3.9755	3.4046	3.0487		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917	26.0917		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**10,036.7744**	**8,610.9883**	**10,746.1895**	**12,132.6250**	**12,447.5117**	**14,137.3311**	**14,976.2842**	**15,638.1660**	**13,876.6367**	**12,593.9434**	**10,596.6260**	**9,909.7705**	**145,702.8467**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	3.0924	2.9230	3.3370	3.9586	3.9282	4.6913	4.8217	5.0559	4.5908	3.9755	3.4046	3.0487		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	1,962,778	1,772,832	1,962,778	1,899,463	1,962,778	1,899,463	1,962,778	1,962,778	1,899,463	1,962,778	1,899,463	1,962,778		Specified monthly throughput
N	Annual Turnovers	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76	8.76		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	45.90	45.90	45.90	45.90	45.90	45.90	45.90	45.90	45.90	45.90	45.90	45.90		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**12,909.505**	**11,159.754**	**14,801.738**	**17,715.625**	**17,751.203**	**22,264.476**	**23,703.948**	**24,441.654**	**21,090.539**	**19,512.002**	**15,063.792**	**12,264.021**	**212,678.257**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	12,909.505	11,159.754	14,801.738	17,715.625	17,751.203	22,264.476	23,703.948	24,441.654	21,090.539	19,512.002	15,063.792	12,264.021	212,678.257	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	268.070	226.536	316.868	405.745	405.332	544.734	586.108	615.448	511.719	447.634	325.065	253.212	4,906.471	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	46.761	39.617	55.076	69.938	69.894	93.074	99.997	104.734	87.533	77.142	56.447	44.198	844.412	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	34.427	29.221	40.451	51.091	51.071	67.637	72.607	75.938	63.653	56.346	41.432	32.555	616.430	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	4.813	3.997	5.822	7.844	7.818	11.063	11.997	12.768	10.328	8.664	6.008	4.526	95.647	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	95.89	81.62	112.22	140.51	140.51	184.43	197.72	206.30	173.76	154.93	114.83	90.74	1,693.46	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/month)	38.989	32.935	46.108	59.079	59.018	79.323	85.345	89.609	74.517	65.179	47.306	36.825	714.233	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.3365	0.2774	0.4111	0.5663	0.5639	0.8160	0.8879	0.9505	0.7597	0.6259	0.4254	0.3159	6.9364	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.025	0.020	0.031	0.046	0.046	0.071	0.078	0.085	0.066	0.051	0.033	0.023	0.576	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	64.86	54.45	77.35	100.96	100.78	138.09	149.01	157.26	129.41	111.44	79.53	61.17	1,224.31	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.957	0.784	1.181	1.661	1.652	2.443	2.668	2.873	2.269	1.836	1.225	0.897	20.445	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	6.24	5.18	7.56	10.21	10.17	14.43	15.65	16.67	13.47	11.27	7.80	5.87	124.53	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	3.43	2.84	4.16	5.65	5.63	8.04	8.73	9.31	7.50	6.24	4.30	3.22	69.05	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (p) Losses (lb/month)	6.729	5.593	8.132	10.935	10.900	15.398	16.694	17.761	14.378	12.079	8.391	6.329	133.319	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-432 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**724.23639**	**688.10645**	**776.04022**	**906.02460**	**899.71722**	**1,056.55054**	**1,083.07153**	**1,130.52551**	**1,036.06982**	**909.52539**	**790.29370**	**714.92902**	**1,130.52551**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.09242	2.92300	3.33699	3.95858	3.92817	4.69127	4.82167	5.05594	4.59082	3.97547	3.40461	3.04868		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	141,507	141,507	141,507	141,507	141,507	141,507	141,507	141,507	141,507	141,507	141,507	141,507		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**724.236**	**688.106**	**776.040**	**906.025**	**899.717**	**1,056.551**	**1,083.072**	**1,130.526**	**1,036.070**	**909.525**	**790.294**	**714.929**	**1,130.526**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	724.236	688.106	776.040	906.025	899.717	1,056.551	1,083.072	1,130.526	1,036.070	909.525	790.294	714.929	1,130.526	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	15.039	13.968	16.613	20.751	20.544	25.850	26.780	28.467	25.138	20.866	17.054	14.761	28.467	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	2.623	2.443	2.888	3.577	3.543	4.417	4.569	4.844	4.300	3.596	2.961	2.577	4.844	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	1.931	1.802	2.121	2.613	2.589	3.210	3.318	3.512	3.127	2.626	2.174	1.898	3.512	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.270	0.246	0.305	0.401	0.396	0.525	0.548	0.591	0.507	0.404	0.315	0.264	0.591	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	5.38	5.03	5.88	7.19	7.12	8.75	9.03	9.54	8.54	7.22	6.02	5.29	9.54	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/hr)	2.187	2.031	2.417	3.021	2.991	3.764	3.900	4.145	3.661	3.038	2.482	2.147	4.145	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.01888	0.01711	0.02156	0.02896	0.02858	0.03872	0.04057	0.04397	0.03732	0.02917	0.02232	0.01841	0.04397	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.002	0.002	0.001	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	3.64	3.36	4.06	5.16	5.11	6.55	6.81	7.27	6.36	5.19	4.17	3.57	7.27	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.054	0.048	0.062	0.085	0.084	0.116	0.122	0.133	0.111	0.086	0.064	0.052	0.133	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.35	0.32	0.40	0.52	0.52	0.68	0.72	0.77	0.66	0.53	0.41	0.34	0.77	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.19	0.17	0.22	0.29	0.29	0.38	0.40	0.43	0.37	0.29	0.23	0.19	0.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.377	0.345	0.426	0.559	0.552	0.731	0.763	0.822	0.706	0.563	0.440	0.369	0.822	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-517 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,135.24
Net Throughput (bbl/yr):	1,306,654	Turnovers Per Year:	17.87
Maximum Pumping Rate (bbl/hr):	5,000.000		
Shell Height (ft):	41.5	Maximum Liquid Height (ft):	37.3
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{V_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Gas Oil**	**January**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**February**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**March**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**April**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**May**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-517 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**June**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**July**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**August**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**September**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**October**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**November**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**December**	**120.00**	**120.00**	**120.00**	**120.00**	**0.1735**	**0.1735**	**0.1735**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0008	0.0008	0.0008	120.19	120.19	0.35%	0.41%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0029	0.0029	0.0029	78.11	78.11	0.03%	1.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0075	0.0075	0.0075	84.16	84.16	0.08%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	0.0012	0.0012	106.17	106.17	0.12%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0050	0.0050	0.0050	86.18	86.18	0.04%	1.91%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0002	0.0002	0.0002	120.19	120.19	0.04%	0.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-517 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0034	0.0034	0.0034	92.14	92.14	0.12%	1.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	0.0042	0.0042	106.17	106.17	0.49%	2.00%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-517 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186	0.8186		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**	**0.0036**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67		Fully insulated tanks assumed equal to T_{LA}
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**	**0.8186**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**2,259.06**	**2,040.44**	**2,259.06**	**2,186.19**	**2,259.06**	**2,186.19**	**2,259.06**	**2,259.06**	**2,186.19**	**2,259.06**	**2,186.19**	**2,259.06**	**26,598.62**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735	0.1735		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	4,660,997	4,209,933	4,660,997	4,510,642	4,660,997	4,510,642	4,660,997	4,660,997	4,510,642	4,660,997	4,510,642	4,660,997		Specified monthly throughput
N	Annual Turnovers	17.87	17.87	17.87	17.87	17.87	17.87	17.87	17.87	17.87	17.87	17.87	17.87		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**2,259.06**	**2,040.44**	**2,259.06**	**2,186.19**	**2,259.06**	**2,186.19**	**2,259.06**	**2,259.06**	**2,186.19**	**2,259.06**	**2,186.19**	**2,259.06**	**26,598.62**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2,259.06	2,040.44	2,259.06	2,186.19	2,259.06	2,186.19	2,259.06	2,259.06	2,186.19	2,259.06	2,186.19	2,259.06	26,598.62	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	157.85	142.57	157.85	152.76	157.85	152.76	157.85	157.85	152.76	157.85	152.76	157.85	1,858.56	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	23.07	20.84	23.07	22.32	23.07	22.32	23.07	23.07	22.32	23.07	22.32	23.07	271.62	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	63.44	57.30	63.44	61.39	63.44	61.39	63.44	63.44	61.39	63.44	61.39	63.44	746.90	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	12.69	11.46	12.69	12.28	12.69	12.28	12.69	12.69	12.28	12.69	12.28	12.69	149.44	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	43.24	39.06	43.24	41.85	43.24	41.85	43.24	43.24	41.85	43.24	41.85	43.24	509.16	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	2.10	1.90	2.10	2.04	2.10	2.04	2.10	2.10	2.04	2.10	2.04	2.10	24.78	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.28	0.25	0.28	0.27	0.28	0.27	0.28	0.28	0.27	0.28	0.27	0.28	3.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	31.29	28.26	31.29	30.28	31.29	30.28	31.29	31.29	30.28	31.29	30.28	31.29	368.40	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	9.21	8.32	9.21	8.92	9.21	8.92	9.21	9.21	8.92	9.21	8.92	9.21	108.47	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	45.17	40.80	45.17	43.72	45.17	43.72	45.17	45.17	43.72	45.17	43.72	45.17	531.87	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-517 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67	579.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	**101.79**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	101.79	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -601 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	50.00	Tank Volume (bbl):	14,000.00
Net Throughput (bbl/yr):	243,882	Turnovers Per Year:	17.43
Maximum Pumping Rate (bbl/hr):	254.388		
Is Roof Supported by Columns? (y/n):	Yes		
No. of Columns:	1	Eff. Col. Diam. (ft):	1
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pan

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.56
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Slop Oil**	**January**	**52.10**	**--**	**--**	**51.78**	**2.2070**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0099	--	--	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0153	--	--	78.11	78.11	1.06%	0.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0119	--	--	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0007	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0046	--	--	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**February**	**49.42**	**--**	**--**	**49.00**	**2.0892**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0092	--	--	114.23	114.23	2.00%	0.63%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0141	--	--	78.11	78.11	1.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0047	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	1.25%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0110	--	--	86.18	86.18	0.55%	0.57%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0042	--	--	92.14	92.14	1.38%	0.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**March**	**55.62**	**--**	**--**	**54.98**	**2.3707**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0110	--	--	114.23	114.23	2.00%	0.66%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0169	--	--	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0056	--	--	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0131	--	--	86.18	86.18	0.55%	0.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0052	--	--	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**April**	**63.83**	**--**	**--**	**62.87**	**2.7894**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0140	--	--	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0212	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0162	--	--	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	--	--	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**May**	**63.44**	**--**	**--**	**62.40**	**2.7679**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0138	--	--	114.23	114.23	2.00%	0.71%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0210	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0160	--	--	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0066	--	--	92.14	92.14	1.38%	0.27%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-601 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**June**	**72.25**	**--**	**--**	**70.94**	**3.2789**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0177	--	--	114.23	114.23	2.00%	0.77%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0266	--	--	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0086	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0200	--	--	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0086	--	--	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**July**	**73.66**	**--**	**--**	**72.37**	**3.3667**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0183	--	--	114.23	114.23	2.00%	0.78%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0276	--	--	78.11	78.11	1.06%	0.80%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0090	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0207	--	--	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0015	--	--	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0089	--	--	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0010	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**August**	**76.14**	**--**	**--**	**75.01**	**3.5267**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0196	--	--	114.23	114.23	2.00%	0.793815%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0294	--	--	78.11	78.11	1.06%	0.814408%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0095	--	--	84.16	84.16	0.36%	0.284739%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0025	--	--	106.17	106.17	1.25%	0.094780%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0220	--	--	86.18	86.18	0.55%	0.670790%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0016	--	--	120.19	120.19	1.88%	0.068320%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0096	--	--	92.14	92.14	1.38%	0.313843%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0011	--	--	106.17	106.17	0.75%	0.039668%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**September**	**71.25**	**--**	**--**	**70.36**	**3.2174**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0172	--	--	114.23	114.23	2.00%	0.76%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0259	--	--	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0084	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0021	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0195	--	--	86.18	86.18	0.55%	0.65%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0083	--	--	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**October**	**64.11**	**--**	**--**	**63.43**	**2.8044**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	--	--	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0214	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	--	--	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	--	--	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**November**	**56.64**	**--**	**--**	**56.23**	**2.4196**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0114	--	--	114.23	114.23	2.00%	0.67%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0174	--	--	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0057	--	--	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0134	--	--	86.18	86.18	0.55%	0.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0053	--	--	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**December**	**51.44**	**--**	**--**	**51.20**	**2.1775**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0097	--	--	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0150	--	--	78.11	78.11	1.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0049	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0117	--	--	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0045	--	--	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-601 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**5.511**	**4.691**	**5.958**	**6.896**	**7.065**	**8.268**	**8.804**	**9.283**	**8.092**	**7.168**	**5.895**	**5.432**	**83.062**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p^*	Value of Vapor Pressure Function	0.0406	0.0382	0.0438	0.0524	0.0520	0.0629	0.0648	0.0683	0.0615	0.0528	0.0448	0.0400		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	2.2070	2.0892	2.3707	2.7894	2.7679	3.2789	3.3667	3.5267	3.2174	2.8044	2.4196	2.1775		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**48.610**	**41.376**	**52.546**	**60.822**	**62.311**	**72.919**	**77.647**	**81.877**	**71.372**	**63.224**	**51.997**	**47.907**	**732.608**	Calculated Using Equation 2-13
p^*	Value of Vapor Pressure Function	0.0406	0.0382	0.0438	0.0524	0.0520	0.0629	0.0648	0.0683	0.0615	0.0528	0.0448	0.0400		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40		Calculated Using Equation 2-14
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**3.945**	**3.563**	**3.945**	**3.818**	**3.945**	**3.818**	**3.945**	**3.945**	**3.818**	**3.945**	**3.818**	**3.945**	**46.447**	Calculated using Equation 2-19
N_C	Number of Columns:	1	1	1	1	1	1	1	1	1	1	1	1		See 'Stored Liquid Characteristics' table above
F_C	Effective Column Diameter (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Stored Liquid Characteristics' table above
Q	Throughput (bbl/month)	20,713	18,709	20,713	20,045	20,713	20,045	20,713	20,713	20,045	20,713	20,045	20,713		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	50	50	50	50	50	50	50	50	50	50	50	50		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**58.066**	**49.630**	**62.448**	**71.535**	**73.321**	**85.004**	**90.396**	**95.105**	**83.282**	**74.337**	**61.710**	**57.283**	**862.118**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	58.066	49.630	62.448	71.535	73.321	85.004	90.396	95.105	83.282	74.337	61.710	57.283	862.118	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	1.583	1.340	1.726	2.049	2.097	2.538	2.719	2.898	2.474	2.132	1.712	1.558	24.826	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.408	0.342	0.449	0.544	0.556	0.683	0.734	0.784	0.665	0.566	0.447	0.401	6.580	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.144	0.121	0.159	0.191	0.195	0.239	0.256	0.274	0.233	0.199	0.158	0.142	2.311	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.085	0.074	0.090	0.102	0.104	0.121	0.128	0.136	0.118	0.106	0.089	0.084	1.238	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	0.34	0.28	0.37	0.44	0.45	0.55	0.59	0.63	0.54	0.46	0.37	0.33	5.36	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/month)	0.427	0.360	0.467	0.561	0.573	0.701	0.751	0.803	0.682	0.584	0.465	0.419	6.792	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0984	0.0865	0.1021	0.1093	0.1123	0.1237	0.1307	0.1362	0.1217	0.1133	0.0999	0.0977	1.3319	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.18	0.16	0.20	0.24	0.24	0.30	0.32	0.34	0.29	0.25	0.20	0.18	2.90	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.06	0.05	0.05	0.04	0.62	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-601 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.121**	**0.117**	**0.127**	**0.143**	**0.142**	**0.161**	**0.165**	**0.171**	**0.159**	**0.143**	**0.129**	**0.120**	**0.171**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
N_C	Number of Columns	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Tank Identification and Physical Characteristics' table above
F_C	Effective Column Diameter (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Tank Identification and Physical Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.007**	**0.007**	**0.008**	**0.010**	**0.009**	**0.011**	**0.012**	**0.012**	**0.011**	**0.010**	**0.008**	**0.007**	**0.012**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.065**	**0.062**	**0.071**	**0.084**	**0.084**	**0.101**	**0.104**	**0.110**	**0.099**	**0.085**	**0.072**	**0.064**	**0.110**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.121**	**0.117**	**0.127**	**0.143**	**0.142**	**0.161**	**0.165**	**0.171**	**0.159**	**0.143**	**0.129**	**0.120**	**0.171**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	0.121	0.117	0.127	0.143	0.142	0.161	0.165	0.171	0.159	0.143	0.129	0.120	0.171	Sum of VOC Component Emissions
L_{Ti}	Total HAP Losses (lb/hr)	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.007	0.007	0.006	0.006	0.008	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/hr)	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/hr)	0.00094	0.00094	0.00095	0.00096	0.00096	0.00098	0.00098	0.00099	0.00098	0.00096	0.00095	0.00094	0.00099	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Fixed Roof Support Col. Well, Built -Up Col., Gasketed Sliding Cover	33	-	-	1
Effective column diameter (ft)	-	-	-	1.00
Default Effective Column Diameter Used?	-	-	-	FALSE
Slotted Guide -Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	-	-	15

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-620 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,538.11
Net Throughput (bbl/yr):	414,351	Turnovers Per Year:	5.64
Maximum Pumping Rate (bbl/hr):	6,600.000		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L}	Z_{V}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Gas Oil**	**January**	**52.20**	**49.04**	**55.36**	**51.78**	**0.0229**	**0.0206**	**0.0255**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0006	78.11	78.11	0.03%	1.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0015	0.0013	0.0016	84.16	84.16	0.08%	4.12%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	2.99%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0005	0.0006	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0005	0.0006	106.17	106.17	0.49%	1.81%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**February**	**49.56**	**46.32**	**52.81**	**49.00**	**0.0210**	**0.0187**	**0.0234**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.27%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.03%	1.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0014	0.0012	0.0015	84.16	84.16	0.08%	4.18%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	3.04%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0005	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0004	0.0005	106.17	106.17	0.49%	1.80%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**March**	**55.84**	**51.58**	**60.10**	**54.98**	**0.0259**	**0.0225**	**0.0298**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.03%	1.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0016	0.0014	0.0018	84.16	84.16	0.08%	4.03%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0011	0.0010	0.0013	86.18	86.18	0.04%	2.92%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0007	92.14	92.14	0.12%	1.59%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0006	0.0005	0.0007	106.17	106.17	0.49%	1.83%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**April**	**64.16**	**58.81**	**69.51**	**62.87**	**0.0340**	**0.0286**	**0.0404**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0018	0.0023	84.16	84.16	0.08%	3.85%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0016	86.18	86.18	0.04%	2.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	0.0006	0.0009	92.14	92.14	0.12%	1.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0009	106.17	106.17	0.49%	1.87%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**May**	**63.78**	**58.81**	**68.75**	**62.40**	**0.0336**	**0.0286**	**0.0394**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-620 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0018	0.0023	84.16	84.16	0.08%	3.85%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0016	86.18	86.18	0.04%	2.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	0.0006	0.0009	92.14	92.14	0.12%	1.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0009	106.17	106.17	0.49%	1.86%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**June**	**72.70**	**65.96**	**79.44**	**70.94**	**0.0446**	**0.0361**	**0.0550**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0010	0.0008	0.0011	78.11	78.11	0.03%	1.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0025	0.0021	0.0030	84.16	84.16	0.08%	3.66%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0018	0.0015	0.0021	86.18	86.18	0.04%	2.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0010	0.0008	0.0012	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0010	0.0008	0.0013	106.17	106.17	0.49%	1.90%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**July**	**74.09**	**67.26**	**80.92**	**72.37**	**0.0466**	**0.0376**	**0.0575**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0010	0.0008	0.0012	78.11	78.11	0.03%	1.29%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0026	0.0022	0.0031	84.16	84.16	0.08%	3.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0018	0.0015	0.0021	86.18	86.18	0.04%	2.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0010	0.0008	0.0012	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0011	0.0009	0.0014	106.17	106.17	0.49%	1.90%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**August**	**76.52**	**69.96**	**83.08**	**75.01**	**0.0503**	**0.0410**	**0.0614**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.33%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0009	0.0013	78.11	78.11	0.03%	1.27%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0028	0.0024	0.0033	84.16	84.16	0.08%	3.58%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0003	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0019	0.0016	0.0022	86.18	86.18	0.04%	2.54%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0011	0.0009	0.0013	92.14	92.14	0.12%	1.53%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0012	0.0009	0.0015	106.17	106.17	0.49%	1.91%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**September**	**71.56**	**65.50**	**77.62**	**70.36**	**0.0431**	**0.0355**	**0.0520**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0009	0.0008	0.0011	78.11	78.11	0.03%	1.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0025	0.0021	0.0029	84.16	84.16	0.08%	3.69%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0003	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0017	0.0015	0.0020	86.18	86.18	0.04%	2.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0009	0.0008	0.0011	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0010	0.0008	0.0012	106.17	106.17	0.49%	1.89%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**October**	**64.34**	**58.02**	**70.66**	**63.43**	**0.0342**	**0.0279**	**0.0419**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0006	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0017	0.0024	84.16	84.16	0.08%	3.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0017	86.18	86.18	0.04%	2.75%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	0.0006	0.0009	92.14	92.14	0.12%	1.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0010	106.17	106.17	0.49%	1.87%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**November**	**56.78**	**52.05**	**61.51**	**56.23**	**0.0267**	**0.0228**	**0.0312**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.29%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.03%	1.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0017	0.0015	0.0019	84.16	84.16	0.08%	4.01%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0012	0.0010	0.0013	86.18	86.18	0.04%	2.90%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0007	92.14	92.14	0.12%	1.58%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0006	0.0005	0.0007	106.17	106.17	0.49%	1.83%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**December**	**51.52**	**48.91**	**54.13**	**51.20**	**0.0224**	**0.0205**	**0.0245**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.03%	1.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0014	0.0013	0.0015	84.16	84.16	0.08%	4.13%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	3.00%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-620 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0005	0.0005	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0005	0.0005	106.17	106.17	0.49%	1.81%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-620 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**87.29**	**75.23**	**137.23**	**216.31**	**203.80**	**351.37**	**381.71**	**389.93**	**303.56**	**269.96**	**153.63**	**67.86**	**2,637.87**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0005	0.0005	0.0006	0.0008	0.0008	0.0010	0.0011	0.0011	0.0010	0.0008	0.0006	0.0005		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0210	0.0217	0.0295	0.0375	0.0346	0.0479	0.0484	0.0463	0.0427	0.0451	0.0332	0.0166		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9734	0.9756	0.9700	0.9610	0.9615	0.9495	0.9473	0.9435	0.9511	0.9608	0.9691	0.9740		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0005**	**0.0005**	**0.0006**	**0.0008**	**0.0008**	**0.0010**	**0.0011**	**0.0011**	**0.0010**	**0.0008**	**0.0006**	**0.0005**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0210	0.0259	0.0340	0.0336	0.0446	0.0466	0.0503	0.0431	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.83	523.45	532.37	533.76	536.19	531.23	524.01	516.45	511.19		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.29	509.80	516.37	525.11	524.84	534.12	535.48	537.70	532.43	524.92	516.99	511.50		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0210**	**0.0217**	**0.0295**	**0.0375**	**0.0346**	**0.0479**	**0.0484**	**0.0463**	**0.0427**	**0.0451**	**0.0332**	**0.0166**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.65	12.98	17.05	21.39	19.88	26.98	27.31	26.25	24.23	25.26	18.93	10.45		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0210	0.0259	0.0340	0.0336	0.0446	0.0466	0.0503	0.0431	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0206	0.0187	0.0225	0.0286	0.0286	0.0361	0.0376	0.0410	0.0355	0.0279	0.0228	0.0205		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0255	0.0234	0.0298	0.0404	0.0394	0.0550	0.0575	0.0614	0.0520	0.0419	0.0312	0.0245		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.83	523.45	532.37	533.76	536.19	531.23	524.01	516.45	511.19		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.71	505.99	511.25	518.48	518.48	525.63	526.93	529.63	525.17	517.69	511.72	508.58		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.03	512.48	519.77	529.18	528.42	539.11	540.59	542.75	537.29	530.33	521.18	513.80		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9734**	**0.9756**	**0.9700**	**0.9610**	**0.9615**	**0.9495**	**0.9473**	**0.9435**	**0.9511**	**0.9608**	**0.9691**	**0.9740**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0210	0.0259	0.0340	0.0336	0.0446	0.0466	0.0503	0.0431	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**107.12**	**88.89**	**120.09**	**150.13**	**153.33**	**193.59**	**208.37**	**223.71**	**187.39**	**156.10**	**119.76**	**104.85**	**1,813.34**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0229	0.0210	0.0259	0.0340	0.0336	0.0446	0.0466	0.0503	0.0431	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	1,478,039	1,335,003	1,478,039	1,430,361	1,478,039	1,430,361	1,478,039	1,478,039	1,430,361	1,478,039	1,430,361	1,478,039		Specified monthly throughput
N	Annual Turnovers	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**194.41**	**164.12**	**257.31**	**366.44**	**357.13**	**544.97**	**590.08**	**613.64**	**490.96**	**426.06**	**273.39**	**172.70**	**4,451.21**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	194.41	164.12	257.31	366.44	357.13	544.97	590.08	613.64	490.96	426.06	273.39	172.70	4,451.21	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	16.40	13.95	21.49	29.91	29.18	43.43	46.84	48.38	39.25	34.75	22.78	14.60	360.96	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	2.80	2.40	3.64	4.97	4.86	7.08	7.62	7.82	6.42	5.78	3.85	2.50	59.74	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	8.01	6.86	10.38	14.09	13.77	19.96	21.45	22.00	18.10	16.37	10.97	7.14	169.09	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1.01	0.85	1.35	1.95	1.90	2.95	3.20	3.34	2.65	2.27	1.43	0.89	23.78	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	5.81	4.99	7.50	10.10	9.87	14.18	15.22	15.57	12.88	11.73	7.92	5.19	120.95	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.14	0.12	0.19	0.29	0.28	0.44	0.48	0.50	0.40	0.33	0.21	0.13	3.51	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.02	0.01	0.33	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	3.10	2.63	4.08	5.73	5.59	8.39	9.06	9.38	7.58	6.66	4.33	2.76	69.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.54	0.44	0.73	1.11	1.08	1.74	1.91	2.01	1.56	1.29	0.78	0.48	13.67	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	3.52	2.95	4.71	6.84	6.66	10.34	11.23	11.72	9.30	7.95	5.01	3.12	83.34	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-620 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**20.11**	**18.48**	**22.56**	**29.17**	**28.83**	**37.64**	**39.21**	**42.08**	**36.40**	**29.33**	**23.24**	**19.68**	**42.08**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.03	0.02		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**20.11**	**18.48**	**22.56**	**29.17**	**28.83**	**37.64**	**39.21**	**42.08**	**36.40**	**29.33**	**23.24**	**19.68**	**42.08**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	20.11	18.48	22.56	29.17	28.83	37.64	39.21	42.08	36.40	29.33	23.24	19.68	42.08	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	1.70	1.57	1.88	2.38	2.36	3.00	3.11	3.32	2.91	2.39	1.94	1.66	3.32	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.29	0.27	0.32	0.40	0.39	0.49	0.51	0.54	0.48	0.40	0.33	0.28	0.54	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.83	0.77	0.91	1.12	1.11	1.38	1.42	1.51	1.34	1.13	0.93	0.81	1.51	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.10	0.10	0.12	0.16	0.15	0.20	0.21	0.23	0.20	0.16	0.12	0.10	0.23	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.60	0.56	0.66	0.80	0.80	0.98	1.01	1.07	0.95	0.81	0.67	0.59	1.07	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.32	0.30	0.36	0.46	0.45	0.58	0.60	0.64	0.56	0.46	0.37	0.31	0.64	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.06	0.05	0.06	0.09	0.09	0.12	0.13	0.14	0.12	0.09	0.07	0.05	0.14	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.36	0.33	0.41	0.54	0.54	0.71	0.75	0.80	0.69	0.55	0.43	0.36	0.80	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,538.11
Net Throughput (bbl/yr):	527,181	Turnovers Per Year:	6.98
Maximum Pumping Rate (bbl/hr):	6,700.000		
Tank Temperature Profile:	Hot Stock	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**75.90**	--	--	**130.00**	**0.0097**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	--	--	78.11	78.11	0.01%	3.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	--	--	84.16	84.16	0.01%	2.17%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	--	--	92.14	92.14	0.04%	3.42%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	--	--	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	--	--	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**74.18**	--	--	**130.00**	**0.0092**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	--	--	78.11	78.11	0.01%	3.14%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	--	--	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	--	--	92.14	92.14	0.04%	3.45%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	--	--	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	--	--	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**78.83**	--	--	**130.00**	**0.0108**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	--	--	78.11	78.11	0.01%	3.01%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	--	--	84.16	84.16	0.01%	2.11%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	--	--	92.14	92.14	0.04%	3.36%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	--	--	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**85.02**	--	--	**130.00**	**0.0133**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	--	--	78.11	78.11	0.01%	2.85%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	--	--	84.16	84.16	0.01%	1.99%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.57%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	--	--	92.14	92.14	0.04%	3.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.88%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Mixture/Product	**No. 2 Fuel Oil**	**May**	**84.85**	--	--	**130.00**	**0.0133**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	--	--	78.11	78.11	0.01%	2.85%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	--	--	84.16	84.16	0.01%	1.99%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.57%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	--	--	92.14	92.14	0.04%	3.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.88%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**91.40**	--	--	**130.00**	**0.0165**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0007	--	--	78.11	78.11	0.01%	2.69%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	--	--	84.16	84.16	0.01%	1.87%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	--	--	92.14	92.14	0.04%	3.11%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**92.35**	--	--	**130.00**	**0.0170**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	--	--	78.11	78.11	0.01%	2.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	--	--	84.16	84.16	0.01%	1.85%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	--	--	92.14	92.14	0.04%	3.10%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**93.88**	--	--	**130.00**	**0.0179**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	--	--	78.11	78.11	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	--	--	84.16	84.16	0.01%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	--	--	92.14	92.14	0.04%	3.07%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**90.13**	--	--	**130.00**	**0.0158**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0007	--	--	78.11	78.11	0.01%	2.72%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	--	--	84.16	84.16	0.01%	1.89%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	--	--	92.14	92.14	0.04%	3.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.05%	0.88%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**84.83**	--	--	**130.00**	**0.0132**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	--	--	78.11	78.11	0.01%	2.85%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	--	--	84.16	84.16	0.01%	1.99%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.57%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	--	--	92.14	92.14	0.04%	3.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.05%	1.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.88%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**79.22**	--	--	**130.00**	**0.0109**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	--	--	78.11	78.11	0.01%	3.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	--	--	84.16	84.16	0.01%	2.10%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	--	--	92.14	92.14	0.04%	3.35%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	--	--	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**75.34**	--	--	**130.00**	**0.0096**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-621 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Benzene						0.0005	--	--	78.11	78.11	0.01%	3.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	--	--	84.16	84.16	0.01%	2.18%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	--	--	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	--	--	92.14	92.14	0.04%	3.43%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	--	--	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	--	--	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	--	--	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.562**	**0.609**	**0.684**	**0.958**	**1.196**	**1.299**	**1.376**	**1.438**	**1.116**	**0.775**	**0.565**	**0.516**	**11.092**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0097	0.0092	0.0108	0.0133	0.0133	0.0165	0.0170	0.0179	0.0158	0.0132	0.0109	0.0096		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.263**	**0.247**	**0.302**	**0.387**	**0.434**	**0.499**	**0.530**	**0.556**	**0.455**	**0.359**	**0.276**	**0.251**	**4.560**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	143.78	159.20	149.45	159.96	174.70	166.60	166.10	165.68	158.68	144.60	139.34	139.99		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**3.747**	**3.385**	**3.747**	**3.626**	**3.747**	**3.626**	**3.747**	**3.747**	**3.626**	**3.747**	**3.626**	**3.747**	**44.120**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	44,774	40,441	44,774	43,330	44,774	43,330	44,774	44,774	43,330	44,774	43,330	44,774		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	120	120	120	120	120	120	120	120	120	120	120	120		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**4.572**	**4.241**	**4.733**	**4.971**	**5.378**	**5.424**	**5.653**	**5.741**	**5.197**	**4.881**	**4.468**	**4.514**	**59.773**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	4.572	4.241	4.733	4.971	5.378	5.424	5.653	5.741	5.197	4.881	4.468	4.514	59.773	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.088	0.090	0.100	0.127	0.151	0.159	0.167	0.173	0.142	0.110	0.087	0.083	1.476	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.026	0.027	0.030	0.039	0.047	0.049	0.051	0.053	0.043	0.033	0.026	0.024	0.448	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.018	0.019	0.021	0.027	0.033	0.034	0.036	0.037	0.030	0.023	0.018	0.017	0.312	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.006	0.006	0.007	0.009	0.010	0.011	0.012	0.012	0.010	0.007	0.006	0.005	0.099	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.004	0.004	0.005	0.006	0.007	0.008	0.008	0.009	0.007	0.006	0.004	0.004	0.074	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.011	0.010	0.011	0.012	0.013	0.013	0.013	0.014	0.012	0.012	0.011	0.011	0.142	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.030	0.031	0.035	0.045	0.054	0.058	0.061	0.063	0.051	0.038	0.030	0.028	0.523	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.012	0.012	0.013	0.016	0.019	0.020	0.021	0.022	0.018	0.015	0.012	0.011	0.190	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	0.011	0.011	0.013	0.016	0.019	0.021	0.022	0.023	0.019	0.014	0.011	0.010	0.190	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.562**	**0.562**	**0.562**	**0.563**	**0.563**	**0.563**	**0.563**	**0.563**	**0.563**	**0.562**	**0.562**	**0.562**	**0.563**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	**0.561**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	159.52	159.52	159.52	159.52	159.52	159.52	159.52	159.52	159.52	159.52	159.52	159.52		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.001**	**0.001**	**0.001**	**0.001**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.001**	**0.001**	**0.001**	**0.002**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.000**	**0.001**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.562**	**0.562**	**0.562**	**0.563**	**0.563**	**0.563**	**0.563**	**0.563**	**0.563**	**0.562**	**0.562**	**0.562**	**0.563**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.562	0.562	0.562	0.563	0.563	0.563	0.563	0.563	0.563	0.562	0.562	0.562	0.563	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.003	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	24
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	28

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-622 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,000.00
Net Throughput (bbl/yr):	510,266	Turnovers Per Year:	7.04
Maximum Pumping Rate (bbl/hr):	6,700.000		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**78.42**	**75.26**	**81.58**	**92.00**	**0.0106**	**0.0095**	**0.0119**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.01%	3.02%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.12%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0005	0.0006	92.14	92.14	0.04%	3.37%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**82.42**	**79.18**	**85.67**	**99.40**	**0.0122**	**0.0109**	**0.0136**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0006	78.11	78.11	0.01%	2.92%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	0.0004	0.0004	84.16	84.16	0.01%	2.04%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0006	92.14	92.14	0.04%	3.29%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0002	0.0002	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**92.29**	**88.03**	**96.55**	**110.90**	**0.0170**	**0.0147**	**0.0195**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0008	78.11	78.11	0.01%	2.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	0.0004	0.0005	84.16	84.16	0.01%	1.85%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	0.0007	0.0008	92.14	92.14	0.04%	3.10%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	0.0002	0.0002	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**91.55**	**86.20**	**96.90**	**104.90**	**0.0166**	**0.0139**	**0.0197**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0002	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0007	0.0007	0.0008	78.11	78.11	0.01%	2.69%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	0.0004	0.0005	84.16	84.16	0.01%	1.87%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	0.0006	0.0008	92.14	92.14	0.04%	3.11%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-622 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (o)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**95.66**	**90.69**	**100.63**	**111.30**	**0.0190**	**0.0161**	**0.0223**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.14%	0.83%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.01%	2.59%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	0.0005	0.0006	84.16	84.16	0.01%	1.80%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.55%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	0.0007	0.0009	92.14	92.14	0.04%	3.03%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.05%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	0.0002	0.0002	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	0.0002	0.0003	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**70.52**	**63.78**	**77.26**	**67.60**	**0.0081**	**0.0063**	**0.0102**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0004	0.0005	78.11	78.11	0.01%	3.25%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.53%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.20%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**94.12**	**87.29**	**100.95**	**103.10**	**0.0180**	**0.0144**	**0.0225**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.14%	0.82%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0005	0.0004	0.0006	84.16	84.16	0.01%	1.82%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0002	106.17	106.17	0.02%	0.56%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.20%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	0.0006	0.0009	92.14	92.14	0.04%	3.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	0.0002	0.0002	106.17	106.17	0.05%	0.87%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**101.09**	**94.53**	**107.65**	**112.70**	**0.0226**	**0.0183**	**0.0278**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0002	0.0002	0.0003	120.19	120.19	0.14%	0.83%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0009	0.0008	0.0011	78.11	78.11	0.01%	2.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0006	0.0005	0.0007	84.16	84.16	0.01%	1.71%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0001	0.0002	106.17	106.17	0.02%	0.55%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0001	128.17	128.17	0.25%	0.21%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0009	0.0008	0.0011	92.14	92.14	0.04%	2.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0003	0.0002	0.0003	106.17	106.17	0.05%	1.04%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	0.0002	0.0003	106.17	106.17	0.05%	0.86%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	0.0003	0.0004	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**81.75**	**75.69**	**87.81**	**86.00**	**0.0119**	**0.0097**	**0.0146**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.01%	2.93%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	0.0003	0.0004	84.16	84.16	0.01%	2.05%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0007	92.14	92.14	0.04%	3.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**80.62**	**74.30**	**86.94**	**88.40**	**0.0115**	**0.0092**	**0.0142**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.01%	2.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	0.0003	0.0004	84.16	84.16	0.01%	2.07%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**61.91**	**57.18**	**66.64**	**64.10**	**0.0059**	**0.0050**	**0.0070**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0004	78.11	78.11	0.01%	3.52%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.49%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.72%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-622 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**57.19**	**54.58**	**59.80**	**59.90**	**0.0050**	**0.0045**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.61%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.83%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-622 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**37.91**	**40.09**	**81.85**	**99.23**	**106.64**	**65.93**	**143.32**	**167.81**	**83.98**	**88.37**	**34.15**	**15.01**	**964.28**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0002	0.0003	0.0004	0.0004	0.0004	0.0002	0.0004	0.0005	0.0003	0.0003	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0196	0.0201	0.0271	0.0351	0.0321	0.0471	0.0458	0.0434	0.0410	0.0430	0.0324	0.0162		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9873	0.9855	0.9799	0.9804	0.9776	0.9904	0.9787	0.9735	0.9858	0.9863	0.9929	0.9941		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0002**	**0.0003**	**0.0004**	**0.0004**	**0.0004**	**0.0002**	**0.0004**	**0.0005**	**0.0003**	**0.0003**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0106	0.0122	0.0170	0.0166	0.0190	0.0081	0.0180	0.0226	0.0119	0.0115	0.0059	0.0050		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	538.09	542.09	551.96	551.22	555.33	530.19	553.79	560.76	541.42	540.29	521.58	516.86		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	524.51	525.11	533.36	537.88	539.69	533.10	544.82	549.16	537.18	532.50	519.38	514.15		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0196**	**0.0201**	**0.0271**	**0.0351**	**0.0321**	**0.0471**	**0.0458**	**0.0434**	**0.0410**	**0.0430**	**0.0324**	**0.0162**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.65	12.98	17.05	21.39	19.88	26.98	27.31	26.25	24.23	25.26	18.93	10.45		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0106	0.0122	0.0170	0.0166	0.0190	0.0081	0.0180	0.0226	0.0119	0.0115	0.0059	0.0050		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0095	0.0109	0.0147	0.0139	0.0161	0.0063	0.0144	0.0183	0.0097	0.0092	0.0050	0.0045		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0119	0.0136	0.0195	0.0197	0.0223	0.0102	0.0225	0.0278	0.0146	0.0142	0.0070	0.0055		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	538.09	542.09	551.96	551.22	555.33	530.19	553.79	560.76	541.42	540.29	521.58	516.86		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	534.93	538.85	547.70	545.87	550.36	523.45	546.96	554.20	535.36	533.97	516.85	514.25		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	541.25	545.34	556.22	556.57	560.30	536.93	560.62	567.32	547.48	546.61	526.31	519.47		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9873**	**0.9855**	**0.9799**	**0.9804**	**0.9776**	**0.9904**	**0.9787**	**0.9735**	**0.9858**	**0.9863**	**0.9929**	**0.9941**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0106	0.0122	0.0170	0.0166	0.0190	0.0081	0.0180	0.0226	0.0119	0.0115	0.0059	0.0050		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**59.79**	**61.88**	**93.86**	**87.90**	**103.56**	**43.14**	**97.57**	**121.19**	**63.35**	**63.53**	**32.42**	**28.40**	**856.58**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0106	0.0122	0.0170	0.0166	0.0190	0.0081	0.0180	0.0226	0.0119	0.0115	0.0059	0.0050		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	1,820,182	1,644,035	1,820,182	1,761,466	1,820,182	1,761,466	1,820,182	1,820,182	1,761,466	1,820,182	1,761,466	1,820,182		Specified monthly throughput
N	Annual Turnovers	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**97.70**	**101.97**	**175.71**	**187.13**	**210.20**	**109.07**	**240.88**	**289.00**	**147.33**	**151.90**	**66.57**	**43.40**	**1,820.87**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	97.70	101.97	175.71	187.13	210.20	109.07	240.88	289.00	147.33	151.90	66.57	43.40	1,820.87	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	10.46	10.69	17.52	18.73	20.60	12.17	23.79	27.55	15.51	16.08	7.77	5.20	186.06	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	2.96	2.97	4.69	5.03	5.44	3.55	6.33	7.14	4.32	4.50	2.34	1.60	50.87	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	2.07	2.08	3.26	3.49	3.78	2.50	4.39	4.94	3.02	3.15	1.66	1.13	35.46	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.57	0.59	0.98	1.05	1.17	0.65	1.34	1.58	0.85	0.88	0.40	0.27	10.33	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.38	0.39	0.67	0.72	0.80	0.42	0.92	1.10	0.57	0.59	0.26	0.17	6.98	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.18	0.19	0.35	0.37	0.43	0.19	0.49	0.61	0.27	0.28	0.11	0.07	3.53	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	3.29	3.35	5.44	5.82	6.38	3.85	7.38	8.49	4.86	5.05	2.48	1.66	58.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.78	0.82	1.44	1.54	1.73	0.86	1.98	2.40	1.19	1.22	0.51	0.33	14.82	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	1.08	1.11	1.87	1.99	2.21	1.22	2.55	3.00	1.61	1.66	0.76	0.50	19.56	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.87	0.91	1.53	1.63	1.82	0.99	2.09	2.47	1.31	1.35	0.61	0.40	16.00	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	1.14	1.18	1.98	2.11	2.34	1.31	2.69	3.16	1.71	1.77	0.81	0.54	20.75	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-622 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**9.01**	**10.26**	**14.02**	**13.70**	**15.56**	**6.93**	**14.84**	**18.35**	**10.04**	**9.68**	**5.16**	**4.37**	**18.35**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**9.01**	**10.26**	**14.02**	**13.70**	**15.56**	**6.93**	**14.84**	**18.35**	**10.04**	**9.68**	**5.16**	**4.37**	**18.35**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	9.01	10.26	14.02	13.70	15.56	6.93	14.84	18.35	10.04	9.68	5.16	4.37	18.35	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.96	1.08	1.40	1.37	1.52	0.77	1.47	1.75	1.06	1.02	0.60	0.52	1.75	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.27	0.30	0.37	0.37	0.40	0.23	0.39	0.45	0.29	0.29	0.18	0.16	0.45	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.19	0.21	0.26	0.26	0.28	0.16	0.27	0.31	0.21	0.20	0.13	0.11	0.31	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.05	0.06	0.08	0.08	0.09	0.04	0.08	0.10	0.06	0.06	0.03	0.03	0.10	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.03	0.04	0.05	0.05	0.06	0.03	0.06	0.07	0.04	0.04	0.02	0.02	0.07	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.02	0.02	0.03	0.03	0.03	0.01	0.03	0.04	0.02	0.02	0.01	0.01	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.30	0.34	0.43	0.43	0.47	0.24	0.45	0.54	0.33	0.32	0.19	0.17	0.54	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.07	0.08	0.12	0.11	0.13	0.05	0.12	0.15	0.08	0.08	0.04	0.03	0.15	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.10	0.11	0.15	0.15	0.16	0.08	0.16	0.19	0.11	0.11	0.06	0.05	0.19	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.08	0.09	0.12	0.12	0.13	0.06	0.13	0.16	0.09	0.09	0.05	0.04	0.16	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.11	0.12	0.16	0.15	0.17	0.08	0.17	0.20	0.12	0.11	0.06	0.05	0.20	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	95,000.00
Net Throughput (bbl/yr):	743,831	Turnovers Per Year:	7.75
Maximum Pumping Rate (bbl/hr):	3,406.299		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-650 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sour Water**	**January**	**52.61**	--	--	**52.34**	**0.0043**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0114	--	--	78.11	78.11	0.50%	160.14%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.32%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.68%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**February**	**50.11**	--	--	**49.76**	**0.0039**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0106	--	--	78.11	78.11	0.50%	163.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.30%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.73%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**March**	**56.67**	--	--	**56.13**	**0.0050**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0128	--	--	78.11	78.11	0.50%	154.12%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.34%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.60%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**April**	**65.40**	--	--	**64.59**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.40%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**May**	**65.12**	--	--	**64.25**	**0.0068**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0162	--	--	78.11	78.11	0.50%	142.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**June**	**74.39**	--	--	**73.29**	**0.0095**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0207	--	--	78.11	78.11	0.50%	130.75%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.45%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0013	--	--	106.17	106.17	0.50%	11.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-650 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Sour Water**	**July**	**75.76**	--	--	**74.67**	**0.0100**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0215	--	--	78.11	78.11	0.50%	129.12%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.46%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0014	--	--	106.17	106.17	0.50%	11.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**August**	**77.99**	--	--	**77.03**	**0.0108**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0227	--	--	78.11	78.11	0.50%	126.518834%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.220116%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.474392%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0015	--	--	106.17	106.17	0.50%	11.089332%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**September**	**72.72**	--	--	**71.96**	**0.0090**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0198	--	--	78.11	78.11	0.50%	132.77%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.44%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0012	--	--	106.17	106.17	0.50%	11.22%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**October**	**65.22**	--	--	**64.64**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**November**	**57.30**	--	--	**56.96**	**0.0051**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0131	--	--	78.11	78.11	0.50%	153.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.35%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.59%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**December**	**51.82**	--	--	**51.62**	**0.0042**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0112	--	--	78.11	78.11	0.50%	161.33%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.31%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.70%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.289**	**0.302**	**0.370**	**0.579**	**0.720**	**0.875**	**0.942**	**1.012**	**0.739**	**0.468**	**0.309**	**0.262**	**6.867**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0043	0.0039	0.0050	0.0069	0.0068	0.0095	0.0100	0.0108	0.0090	0.0069	0.0051	0.0042		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.115**	**0.105**	**0.140**	**0.201**	**0.225**	**0.289**	**0.312**	**0.336**	**0.259**	**0.186**	**0.129**	**0.109**	**2.405**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	143.34	159.35	149.22	160.14	175.54	167.06	166.54	166.11	158.81	144.18	138.75	139.42		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**4.532**	**4.093**	**4.532**	**4.386**	**4.532**	**4.386**	**4.532**	**4.532**	**4.386**	**4.532**	**4.386**	**4.532**	**53.359**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	63,175	57,061	63,175	61,137	63,175	61,137	63,175	63,175	61,137	63,175	61,137	63,175		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	140	140	140	140	140	140	140	140	140	140	140	140		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**4.936**	**4.500**	**5.042**	**5.165**	**5.477**	**5.549**	**5.786**	**5.881**	**5.383**	**5.186**	**4.823**	**4.903**	**62.631**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	4.936	4.500	5.042	5.165	5.477	5.549	5.786	5.881	5.383	5.186	4.823	4.903	62.631	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.787	0.799	0.938	1.289	1.550	1.747	1.858	1.956	1.531	1.099	0.811	0.734	15.099	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.670	0.688	0.808	1.130	1.369	1.543	1.642	1.729	1.347	0.953	0.693	0.621	13.192	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.023	0.021	0.023	0.023	0.024	0.024	0.025	0.026	0.024	0.024	0.023	0.023	0.285	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/month)	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.07	0.07	0.08	0.11	0.13	0.15	0.16	0.17	0.13	0.10	0.07	0.07	1.32	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.245**	**0.245**	**0.245**	**0.245**	**0.246**	**0.246**	**0.246**	**0.246**	**0.246**	**0.245**	**0.245**	**0.245**	**0.246**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.001**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.245**	**0.245**	**0.245**	**0.245**	**0.246**	**0.246**	**0.246**	**0.246**	**0.246**	**0.245**	**0.245**	**0.245**	**0.246**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.245	0.245	0.245	0.245	0.246	0.246	0.246	0.246	0.246	0.245	0.245	0.245	0.246	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.007	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.003	0.002	0.002	0.002	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	4
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	10
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	33

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-651 (Pre-Project Actuals)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	106,928.40
Net Throughput (bbl/yr):	1,298,071	Turnovers Per Year:	12.14
Maximum Pumping Rate (bbl/hr):	1,113.800		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-651 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sour Water**	**January**	**95.00**	--	--	**52.33**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**February**	**95.00**	--	--	**49.74**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**March**	**95.00**	--	--	**56.10**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**April**	**95.00**	--	--	**64.55**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**May**	**95.00**	--	--	**64.21**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-651 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Sour Water**	**June**	**95.00**	--	--	**73.23**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**July**	**95.00**	--	--	**74.62**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**August**	**95.00**	--	--	**76.98**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.557153%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.269683%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.588128%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.626323%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**September**	**95.00**	--	--	**71.92**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**October**	**95.00**	--	--	**64.62**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**November**	**95.00**	--	--	**56.94**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**December**	**95.00**	--	--	**51.61**	**0.0191**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0346	--	--	78.11	78.11	0.50%	108.56%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0001	--	--	108.14	108.14	0.50%	0.27%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0002	--	--	94.11	94.11	0.50%	0.59%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0025	--	--	106.17	106.17	0.50%	10.63%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-651 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**1.287**	**1.480**	**1.414**	**1.603**	**2.014**	**1.757**	**1.803**	**1.793**	**1.574**	**1.305**	**1.152**	**1.205**	**18.388**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191	0.0191		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.507**	**0.511**	**0.528**	**0.550**	**0.625**	**0.574**	**0.592**	**0.590**	**0.545**	**0.510**	**0.474**	**0.492**	**6.497**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	141.26	157.64	147.27	158.45	174.21	165.54	165.00	164.56	157.09	142.13	136.57	137.26		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**7.909**	**7.143**	**7.909**	**7.654**	**7.909**	**7.654**	**7.909**	**7.909**	**7.654**	**7.909**	**7.654**	**7.909**	**93.118**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	110,247	99,578	110,247	106,691	110,247	106,691	110,247	110,247	106,691	110,247	106,691	110,247		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	140	140	140	140	140	140	140	140	140	140	140	140		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**9.702**	**9.134**	**9.850**	**9.807**	**10.547**	**9.985**	**10.304**	**10.292**	**9.773**	**9.723**	**9.280**	**9.606**	**118.002**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	9.702	9.134	9.850	9.807	10.547	9.985	10.304	10.292	9.773	9.723	9.280	9.606	118.002	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	2.354	2.571	2.532	2.779	3.369	2.993	3.076	3.062	2.739	2.380	2.147	2.238	32.240	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	1.987	2.197	2.147	2.386	2.904	2.579	2.650	2.638	2.349	2.020	1.814	1.893	27.564	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.055	0.051	0.056	0.054	0.057	0.055	0.057	0.057	0.054	0.055	0.053	0.055	0.659	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/month)	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.74	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.23	0.26	0.26	0.28	0.33	0.30	0.30	0.30	0.27	0.24	0.22	0.22	3.21	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-651 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.082**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.082**	**0.082**	**0.082**	**0.083**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.002**	**0.002**	**0.002**	**0.002**	**0.003**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.003**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.082**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.082**	**0.082**	**0.082**	**0.083**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.082	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.082	0.082	0.082	0.083	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.004	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.003	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	4
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	18
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	12

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -692 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	56,000.00
Net Throughput (bbl/yr):	2,650,447	Turnovers Per Year:	47.36
Maximum Pumping Rate (bbl/hr):	2,286.735		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Motor Gasoline RVP 12.5**	**January**	**52.58**	**--**	**--**	**52.24**	**5.7727**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0004	--	--	120.19	120.19	3.40%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0144	--	--	114.23	114.23	3.73%	0.44%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0087	--	--	78.11	78.11	0.78%	0.18%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0106	--	--	84.16	84.16	0.98%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.57%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0353	--	--	86.18	86.18	2.10%	0.81%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0009	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0169	--	--	92.14	92.14	6.45%	0.41%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0046	--	--	106.17	106.17	7.70%	0.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 12.5**	**February**	**50.07**	**--**	**--**	**49.62**	**5.4984**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0004	--	--	120.19	120.19	3.40%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0134	--	--	114.23	114.23	3.73%	0.43%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0081	--	--	78.11	78.11	0.78%	0.18%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0099	--	--	84.16	84.16	0.98%	0.23%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	1.57%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0329	--	--	86.18	86.18	2.10%	0.79%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0009	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0155	--	--	92.14	92.14	6.45%	0.40%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0042	--	--	106.17	106.17	7.70%	0.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**March**	**56.61**	**--**	**--**	**55.92**	**2.9908**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0005	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0162	--	--	114.23	114.23	3.73%	0.89%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0098	--	--	78.11	78.11	0.78%	0.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0118	--	--	84.16	84.16	0.98%	0.48%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.57%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0393	--	--	86.18	86.18	2.10%	1.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0010	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0192	--	--	92.14	92.14	6.45%	0.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0053	--	--	106.17	106.17	7.70%	0.27%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**April**	**65.30**	**--**	**--**	**64.28**	**3.5744**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0007	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0209	--	--	114.23	114.23	3.73%	0.95%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0124	--	--	78.11	78.11	0.78%	0.39%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0150	--	--	84.16	84.16	0.98%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.57%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0492	--	--	86.18	86.18	2.10%	1.69%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0012	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0251	--	--	92.14	92.14	6.45%	0.92%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0072	--	--	106.17	106.17	7.70%	0.31%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**May**	**65.02**	**--**	**--**	**63.91**	**3.5540**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0006	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0207	--	--	114.23	114.23	3.73%	0.95%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0123	--	--	78.11	78.11	0.78%	0.39%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0149	--	--	84.16	84.16	0.98%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.57%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0488	--	--	86.18	86.18	2.10%	1.69%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0012	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0249	--	--	92.14	92.14	6.45%	0.92%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0072	--	--	106.17	106.17	7.70%	0.31%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**June**	**74.26**	**--**	**--**	**72.86**	**4.2688**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0009	--	--	120.19	120.19	3.40%	0.04%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0267	--	--	114.23	114.23	3.73%	1.02%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0158	--	--	78.11	78.11	0.78%	0.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0189	--	--	84.16	84.16	0.98%	0.53%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	--	--	106.17	106.17	1.57%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0615	--	--	86.18	86.18	2.10%	1.77%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0015	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0327	--	--	92.14	92.14	6.45%	1.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0098	--	--	106.17	106.17	7.70%	0.35%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**July**	**75.63**	**--**	**--**	**74.25**	**4.3837**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0010	--	--	120.19	120.19	3.40%	0.04%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0277	--	--	114.23	114.23	3.73%	1.03%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0163	--	--	78.11	78.11	0.78%	0.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0195	--	--	84.16	84.16	0.98%	0.54%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0024	--	--	106.17	106.17	1.57%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0636	--	--	86.18	86.18	2.10%	1.78%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0015	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0340	--	--	92.14	92.14	6.45%	1.02%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0102	--	--	106.17	106.17	7.70%	0.35%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**August**	**77.87**	**--**	**--**	**76.66**	**4.5779**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0011	--	--	120.19	120.19	3.40%	0.039600%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0294	--	--	114.23	114.23	3.73%	1.047885%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0173	--	--	78.11	78.11	0.78%	0.421912%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0207	--	--	84.16	84.16	0.98%	0.542709%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0026	--	--	106.17	106.17	1.57%	0.085050%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0671	--	--	86.18	86.18	2.10%	1.804406%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0016	--	--	68.12	68.12	0.01%	0.034343%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.002443%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.000339%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0363	--	--	92.14	92.14	6.45%	1.044238%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0110	--	--	106.17	106.17	7.70%	0.364812%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**September**	**72.63**	**--**	**--**	**71.67**	**4.1348**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0009	--	--	120.19	120.19	3.40%	0.04%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0255	--	--	114.23	114.23	3.73%	1.01%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0151	--	--	78.11	78.11	0.78%	0.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0181	--	--	84.16	84.16	0.98%	0.53%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	--	--	106.17	106.17	1.57%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0591	--	--	86.18	86.18	2.10%	1.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0015	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0312	--	--	92.14	92.14	6.45%	0.99%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0093	--	--	106.17	106.17	7.70%	0.34%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**October**	**65.15**	**--**	**--**	**64.42**	**3.5634**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0007	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0208	--	--	114.23	114.23	3.73%	0.95%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0124	--	--	78.11	78.11	0.78%	0.39%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0149	--	--	84.16	84.16	0.98%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.57%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0490	--	--	86.18	86.18	2.10%	1.69%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0012	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0250	--	--	92.14	92.14	6.45%	0.92%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0072	--	--	106.17	106.17	7.70%	0.31%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 12.5**	**November**	**57.26**	**--**	**--**	**56.83**	**6.3152**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0005	--	--	120.19	120.19	3.40%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0166	--	--	114.23	114.23	3.73%	0.46%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0100	--	--	78.11	78.11	0.78%	0.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Cyclohexane						0.0121	--	--	84.16	84.16	0.98%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.57%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0399	--	--	86.18	86.18	2.10%	0.84%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0010	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0196	--	--	92.14	92.14	6.45%	0.44%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0055	--	--	106.17	106.17	7.70%	0.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 14**	**December**	**51.80**	**--**	**--**	**51.55**	**6.4689**	**--**	**--**	**92.00**	**62.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 14 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0004	--	--	120.19	120.19	3.40%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0141	--	--	114.23	114.23	3.73%	0.40%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0085	--	--	78.11	78.11	0.78%	0.17%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0104	--	--	84.16	84.16	0.98%	0.22%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.57%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0345	--	--	86.18	86.18	2.10%	0.74%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0009	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0164	--	--	92.14	92.14	6.45%	0.38%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0045	--	--	106.17	106.17	7.70%	0.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**175.117**	**189.258**	**94.889**	**131.715**	**164.391**	**177.553**	**188.109**	**197.039**	**153.201**	**106.856**	**176.230**	**181.458**	**1,935.817**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.1237	0.1163	0.0567	0.0694	0.0689	0.0853	0.0881	0.0928	0.0822	0.0691	0.1391	0.1436		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	5.7727	5.4984	2.9908	3.5744	3.5540	4.2688	4.3837	4.5779	4.1348	3.5634	6.3152	6.4689		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	65.00	65.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	65.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**106.774**	**102.296**	**55.157**	**70.819**	**80.694**	**91.418**	**97.155**	**102.034**	**83.103**	**64.687**	**111.909**	**114.518**	**1,080.564**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.1237	0.1163	0.0567	0.0694	0.0689	0.0853	0.0881	0.0928	0.0822	0.0691	0.1391	0.1436		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	65.00	65.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	65.00	62.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	156.34	176.42	163.69	177.43	196.94	186.18	185.52	184.97	175.75	157.40	150.62	151.46		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**17.831**	**16.106**	**17.831**	**17.256**	**17.831**	**17.256**	**17.831**	**17.831**	**17.256**	**17.831**	**17.256**	**17.831**	**209.947**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	225,106	203,322	225,106	217,845	225,106	217,845	225,106	225,106	217,845	225,106	217,845	225,106		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		From Chemical Properties Database
D	Tank Diameter (ft)	100	100	100	100	100	100	100	100	100	100	100	100		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**299.722**	**307.660**	**167.877**	**219.791**	**262.916**	**286.227**	**303.095**	**316.904**	**253.560**	**189.375**	**305.395**	**313.807**	**3,226.328**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	299.722	307.660	167.877	219.791	262.916	286.227	303.095	316.904	253.560	189.375	305.395	313.807	3,226.328	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	9.697	9.350	10.114	12.700	14.653	16.407	17.429	18.309	14.756	11.476	9.973	9.470	154.333	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.651	0.643	0.687	0.921	1.089	1.243	1.326	1.401	1.099	0.805	0.681	0.631	11.175	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.844	0.835	0.889	1.188	1.406	1.599	1.703	1.798	1.413	1.037	0.881	0.818	14.410	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.367	0.339	0.376	0.417	0.456	0.489	0.516	0.535	0.459	0.403	0.367	0.363	5.086	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	2.66	2.65	2.80	3.79	4.52	5.13	5.47	5.77	4.52	3.28	2.78	2.57	45.94	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/month)	1.904	1.848	1.996	2.573	2.994	3.389	3.606	3.800	3.026	2.297	1.973	1.854	31.258	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isoprene Losses (lb/month)	0.050	0.051	0.052	0.070	0.085	0.094	0.100	0.105	0.083	0.060	0.052	0.048	0.848	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0190	0.0174	0.0193	0.0202	0.0216	0.0224	0.0234	0.0240	0.0215	0.0201	0.0187	0.0189	0.2464	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.041	0.037	0.041	0.040	0.041	0.040	0.042	0.042	0.040	0.041	0.040	0.041	0.485	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	2.32	2.21	2.42	2.98	3.41	3.83	4.07	4.27	3.46	2.73	2.38	2.27	36.33	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.642	0.582	0.646	0.651	0.683	0.687	0.715	0.725	0.672	0.660	0.627	0.640	7.929	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.74	1.61	1.78	1.95	2.12	2.26	2.38	2.46	2.13	1.90	1.74	1.72	23.81	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.560**	**0.615**	**0.383**	**0.462**	**0.511**	**0.555**	**0.565**	**0.583**	**0.509**	**0.412**	**0.581**	**0.579**	**0.615**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.235**	**0.282**	**0.128**	**0.183**	**0.221**	**0.247**	**0.253**	**0.265**	**0.213**	**0.144**	**0.245**	**0.244**	**0.282**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.144**	**0.152**	**0.074**	**0.098**	**0.108**	**0.127**	**0.131**	**0.137**	**0.115**	**0.087**	**0.155**	**0.154**	**0.155**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.560**	**0.615**	**0.383**	**0.462**	**0.511**	**0.555**	**0.565**	**0.583**	**0.509**	**0.412**	**0.581**	**0.579**	**0.615**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	0.560	0.615	0.383	0.462	0.511	0.555	0.565	0.583	0.509	0.412	0.581	0.579	0.615	Sum of VOC Component Emissions
L_{Ti}	Total HAP Losses (lb/hr)	0.049	0.050	0.049	0.053	0.055	0.058	0.059	0.060	0.056	0.051	0.049	0.048	0.060	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/hr)	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.003	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.004	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/hr)	0.008	0.009	0.009	0.009	0.010	0.011	0.011	0.011	0.010	0.009	0.009	0.009	0.011	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isoprene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/hr)	0.00017	0.00017	0.00017	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00017	0.00017	0.00017	0.00018	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3 -in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	17
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	16

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -692 (Pre-Project PTE, Max Hourly)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	56,000.00
Net Throughput (bbl/yr):	2,650,447	Turnovers Per Year:	47.36
Maximum Pumping Rate (bbl/hr):	2,286.735		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Motor Gasoline RVP 12.5**	**January**	**88.25**	**--**	**--**	**95.00**	**11.0001**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0015	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0385	--	--	114.23	114.23	3.73%	0.61%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0224	--	--	78.11	78.11	0.78%	0.24%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0266	--	--	84.16	84.16	0.98%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0036	--	--	106.17	106.17	1.57%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0856	--	--	86.18	86.18	2.10%	1.03%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0020	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0485	--	--	92.14	92.14	6.45%	0.63%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0153	--	--	106.17	106.17	7.70%	0.23%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 12.5**	**February**	**88.25**	**--**	**--**	**95.00**	**11.0001**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0015	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0385	--	--	114.23	114.23	3.73%	0.61%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0224	--	--	78.11	78.11	0.78%	0.24%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0266	--	--	84.16	84.16	0.98%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0036	--	--	106.17	106.17	1.57%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0856	--	--	86.18	86.18	2.10%	1.03%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0020	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0485	--	--	92.14	92.14	6.45%	0.63%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0153	--	--	106.17	106.17	7.70%	0.23%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**March**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**April**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Pre-Project PTE, Max Hourly)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**May**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**June**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**July**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**August**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.052688%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.179722%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.467244%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.595380%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.104748%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.948716%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.034756%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.003127%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.000488%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.216884%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.451536%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**September**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 6**	**October**	**95.00**	**--**	**--**	**95.00**	**6.2986**	**--**	**--**	**92.00**	**70.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 6.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0019	--	--	120.19	120.19	3.40%	0.05%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0455	--	--	114.23	114.23	3.73%	1.18%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0264	--	--	78.11	78.11	0.78%	0.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0312	--	--	84.16	84.16	0.98%	0.60%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0043	--	--	106.17	106.17	1.57%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0997	--	--	86.18	86.18	2.10%	1.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0022	--	--	68.12	68.12	0.01%	0.03%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0582	--	--	92.14	92.14	6.45%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0188	--	--	106.17	106.17	7.70%	0.45%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 12.5**	**November**	**88.25**	**--**	**--**	**95.00**	**11.0001**	**--**	**--**	**92.00**	**65.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 12.5 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0015	--	--	120.19	120.19	3.40%	0.03%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0385	--	--	114.23	114.23	3.73%	0.61%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0224	--	--	78.11	78.11	0.78%	0.24%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Pre-Project PTE, Max Hourly)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Cyclohexane						0.0266	--	--	84.16	84.16	0.98%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0036	--	--	106.17	106.17	1.57%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0856	--	--	86.18	86.18	2.10%	1.03%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0020	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0485	--	--	92.14	92.14	6.45%	0.63%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0153	--	--	106.17	106.17	7.70%	0.23%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Motor Gasoline RVP 14**	**December**	**81.24**	**--**	**--**	**95.00**	**11.0002**	**--**	**--**	**92.00**	**62.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 14 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0012	--	--	120.19	120.19	3.40%	0.02%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0321	--	--	114.23	114.23	3.73%	0.54%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0189	--	--	78.11	78.11	0.78%	0.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0225	--	--	84.16	84.16	0.98%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0029	--	--	106.17	106.17	1.57%	0.04%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0727	--	--	86.18	86.18	2.10%	0.92%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isoprene						0.0017	--	--	68.12	68.12	0.01%	0.02%	Equation 1-26 (Antoine's equation). A = 6.09, B = 706.9, C = 186.1.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.23%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0400	--	--	92.14	92.14	6.45%	0.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0123	--	--	106.17	106.17	7.70%	0.19%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Pre-Project PTE, Max Hourly)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**1.193**	**1.414**	**0.674**	**0.743**	**0.844**	**0.788**	**0.784**	**0.782**	**0.735**	**0.643**	**1.132**	**1.097**	**1.414**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.629**	**0.800**	**0.312**	**0.365**	**0.444**	**0.400**	**0.398**	**0.396**	**0.359**	**0.288**	**0.582**	**0.561**	**0.800**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.383**	**0.433**	**0.181**	**0.196**	**0.218**	**0.206**	**0.205**	**0.205**	**0.195**	**0.174**	**0.369**	**0.354**	**0.433**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**1.193**	**1.414**	**0.674**	**0.743**	**0.844**	**0.788**	**0.784**	**0.782**	**0.735**	**0.643**	**1.132**	**1.097**	**1.414**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	1.193	1.414	0.674	0.743	0.844	0.788	0.784	0.782	0.735	0.643	1.132	1.097	1.414	Sum of VOC Component Emissions
L_{Ti}	Total HAP Losses (lb/hr)	0.069	0.076	0.068	0.071	0.077	0.074	0.073	0.073	0.071	0.066	0.068	0.063	0.077	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/hr)	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.005	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.005	0.006	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.006	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/hr)	0.013	0.014	0.013	0.013	0.015	0.014	0.014	0.014	0.013	0.012	0.013	0.012	0.015	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isoprene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/hr)	0.00019	0.00019	0.00018	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00018	0.00018	0.00018	0.00019	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.006	0.006	0.006	0.006	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.007	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3 -in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	17
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	16

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -699 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	60.00	Tank Volume (bbl):	18,632.73
Net Throughput (bbl/yr):	522,234	Turnovers Per Year:	28.80
Maximum Pumping Rate (bbl/hr):	624.241		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.88
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.15**	**48.78**	**55.52**	**51.78**	**0.0041**	**0.00360**	**0.00465**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.49**	**46.07**	**52.91**	**49.00**	**0.0037**	**0.00323**	**0.00421**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00003	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.82%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.73**	**51.26**	**60.20**	**54.98**	**0.0047**	**0.00396**	**0.00554**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00033	78.11	78.11	0.01%	3.73%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**63.98**	**58.42**	**69.54**	**62.87**	**0.0064**	**0.00519**	**0.00779**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00043	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.60**	**58.48**	**68.72**	**62.40**	**0.0063**	**0.00520**	**0.00756**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-699 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00006	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00042	78.11	78.11	0.01%	3.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.46**	**65.48**	**79.44**	**70.94**	**0.0086**	**0.00672**	**0.01102**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**73.86**	**66.78**	**80.94**	**72.37**	**0.0091**	**0.00705**	**0.01161**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00057	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.32**	**69.48**	**83.16**	**75.01**	**0.0099**	**0.00777**	**0.01252**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00007	0.00011	120.19	120.19	0.14%	0.797967%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00042	0.00060	78.11	78.11	0.01%	3.083139%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000408%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.161532%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.585642%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385807%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.179745%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.409146%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.105798%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.897988%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.177993%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.40**	**65.04**	**77.76**	**70.36**	**0.0083**	**0.00662**	**0.01040**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00009	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00038	0.00053	78.11	78.11	0.01%	3.23%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.21**	**57.50**	**70.92**	**63.43**	**0.0064**	**0.00501**	**0.00818**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00044	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.43%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.70**	**51.64**	**61.76**	**56.23**	**0.0049**	**0.00401**	**0.00587**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00034	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.62%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.47**	**48.68**	**54.26**	**51.20**	**0.0040**	**0.00358**	**0.00444**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.89%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-699 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-699 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.9301**	**4.1311**	**7.3904**	**11.6823**	**10.9854**	**19.2343**	**21.0583**	**21.9661**	**16.9530**	**14.6779**	**8.3616**	**3.9912**	**145.3617**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0264	0.0270	0.0348	0.0427	0.0393	0.0528	0.0534	0.0514	0.0482	0.0514	0.0393	0.0219		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9952	0.9957	0.9945	0.9926	0.9927	0.9900	0.9895	0.9885	0.9903	0.9925	0.9943	0.9953		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96		Calculated Using Equation 1-3
D	Tank Diameter (ft)	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.82	509.16	515.40	523.65	523.27	532.13	533.53	535.99	531.07	523.88	516.37	511.14		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.18	509.65	516.14	524.77	524.47	533.65	535.02	537.30	532.11	524.67	516.85	511.42		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0264**	**0.0270**	**0.0348**	**0.0427**	**0.0393**	**0.0528**	**0.0534**	**0.0514**	**0.0482**	**0.0514**	**0.0393**	**0.0219**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.47	13.70	17.89	22.25	20.50	27.94	28.33	27.36	25.44	26.83	20.23	11.16		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0032	0.0040	0.0052	0.0052	0.0067	0.0070	0.0078	0.0066	0.0050	0.0040	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0082	0.0059	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.82	509.16	515.40	523.65	523.27	532.13	533.53	535.99	531.07	523.88	516.37	511.14		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.45	505.74	510.93	518.09	518.15	525.15	526.45	529.15	524.71	517.17	511.31	508.35		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.19	512.58	519.87	529.21	528.39	539.11	540.61	542.83	537.43	530.59	521.43	513.93		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9952**	**0.9957**	**0.9945**	**0.9926**	**0.9927**	**0.9900**	**0.9895**	**0.9885**	**0.9903**	**0.9925**	**0.9943**	**0.9953**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**24.1058**	**19.7546**	**27.4034**	**35.4265**	**36.1230**	**47.2509**	**51.1664**	**55.5337**	**45.6407**	**36.9225**	**27.4678**	**23.5212**	**430.3163**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	1,862,872	1,682,594	1,862,872	1,802,780	1,862,872	1,802,780	1,862,872	1,862,872	1,802,780	1,862,872	1,802,780	1,862,872		Specified monthly throughput
N	Annual Turnovers	28.80	28.80	28.80	28.80	28.80	28.80	28.80	28.80	28.80	28.80	28.80	28.80		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**29.036**	**23.886**	**34.794**	**47.109**	**47.108**	**66.485**	**72.225**	**77.500**	**62.594**	**51.600**	**35.829**	**27.512**	**575.678**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	29.036	23.886	34.794	47.109	47.108	66.485	72.225	77.500	62.594	51.600	35.829	27.512	575.678	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	3.570	2.979	4.198	5.441	5.451	7.344	7.920	8.390	6.953	5.952	4.300	3.395	65.892	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	1.121	0.946	1.299	1.628	1.633	2.124	2.278	2.389	2.019	1.779	1.325	1.069	19.608	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.798	0.674	0.922	1.150	1.154	1.492	1.599	1.675	1.420	1.256	0.940	0.761	13.842	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.180	0.149	0.214	0.284	0.285	0.393	0.426	0.454	0.371	0.311	0.220	0.171	3.457	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.1113	0.0913	0.1337	0.1817	0.1817	0.2566	0.2788	0.2990	0.2416	0.1990	0.1378	0.1054	2.2179	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.043	0.035	0.053	0.077	0.077	0.116	0.128	0.139	0.109	0.085	0.055	0.041	0.957	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	1.15	0.96	1.34	1.73	1.73	2.32	2.50	2.64	2.20	1.89	1.38	1.09	20.93	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.217	0.177	0.263	0.365	0.364	0.526	0.573	0.618	0.494	0.400	0.271	0.205	4.473	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	0.34	0.28	0.40	0.54	0.54	0.74	0.80	0.86	0.70	0.59	0.41	0.32	6.51	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	0.27	0.22	0.32	0.43	0.43	0.60	0.65	0.70	0.57	0.47	0.33	0.26	5.25	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (p) Losses (lb/month)	0.364	0.301	0.432	0.573	0.574	0.791	0.857	0.913	0.747	0.628	0.444	0.345	6.969	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-699 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.33954**	**0.30814**	**0.38627**	**0.51637**	**0.50962**	**0.68921**	**0.72221**	**0.78358**	**0.66513**	**0.52049**	**0.39988**	**0.33125**	**0.78358**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00409	0.00370	0.00469	0.00637	0.00628	0.00864	0.00907	0.00989	0.00832	0.00642	0.00486	0.00399		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.340**	**0.308**	**0.386**	**0.516**	**0.510**	**0.689**	**0.722**	**0.784**	**0.665**	**0.520**	**0.400**	**0.331**	**0.784**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.340	0.308	0.386	0.516	0.510	0.689	0.722	0.784	0.665	0.520	0.400	0.331	0.784	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.042	0.038	0.047	0.060	0.059	0.076	0.079	0.085	0.074	0.060	0.048	0.041	0.085	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.013	0.012	0.014	0.018	0.018	0.022	0.023	0.024	0.021	0.018	0.015	0.013	0.024	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.009	0.009	0.010	0.013	0.012	0.015	0.016	0.017	0.015	0.013	0.010	0.009	0.017	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.004	0.003	0.002	0.002	0.005	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00130	0.00118	0.00148	0.00199	0.00197	0.00266	0.00279	0.00302	0.00257	0.00201	0.00154	0.00127	0.00302	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.003	0.002	0.003	0.004	0.004	0.005	0.006	0.006	0.005	0.004	0.003	0.002	0.006	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.004	0.004	0.005	0.006	0.006	0.008	0.009	0.009	0.008	0.006	0.005	0.004	0.009	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -700 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	26.00	Tank Volume (bbl):	2,364.06
Net Throughput (bbl/yr):	1,166,667	Turnovers Per Year:	514.01
Maximum Pumping Rate (bbl/hr):	959.975		
Shell Height (ft):	30	Maximum Liquid Height (ft):	25
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.81
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.10**	**48.56**	**55.64**	**51.78**	**0.0041**	**0.00356**	**0.00467**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.95%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.42**	**45.84**	**53.00**	**49.00**	**0.0037**	**0.00321**	**0.00423**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00003	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.63**	**50.98**	**60.28**	**54.98**	**0.0047**	**0.00391**	**0.00556**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00025	0.00033	78.11	78.11	0.01%	3.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**63.84**	**58.09**	**69.59**	**62.87**	**0.0063**	**0.00512**	**0.00780**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00043	78.11	78.11	0.01%	3.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.44**	**58.18**	**68.70**	**62.40**	**0.0062**	**0.00514**	**0.00755**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-700 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00006	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00042	78.11	78.11	0.01%	3.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.26**	**65.07**	**79.45**	**70.94**	**0.0086**	**0.00663**	**0.01103**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.20%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0004	84.16	84.16	0.01%	2.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**73.66**	**66.36**	**80.96**	**72.37**	**0.0090**	**0.00694**	**0.01161**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00057	78.11	78.11	0.01%	3.16%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.22%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.14**	**69.06**	**83.22**	**75.01**	**0.0098**	**0.00765**	**0.01254**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00011	120.19	120.19	0.14%	0.797658%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00042	0.00060	78.11	78.11	0.01%	3.088217%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000407%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.165320%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.585916%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385821%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.179517%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.412854%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.106259%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.898254%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.178578%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.26**	**64.64**	**77.88**	**70.36**	**0.0083**	**0.00652**	**0.01044**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00005	0.00009	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00037	0.00053	78.11	78.11	0.01%	3.23%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.11**	**57.06**	**71.16**	**63.43**	**0.0064**	**0.00493**	**0.00825**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00030	0.00044	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.64**	**51.30**	**61.98**	**56.23**	**0.0049**	**0.00396**	**0.00592**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00035	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.44**	**48.50**	**54.38**	**51.20**	**0.0040**	**0.00356**	**0.00446**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.89%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-700 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-700 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.7823**	**0.6504**	**1.1574**	**1.8158**	**1.6946**	**2.9758**	**3.2629**	**3.4192**	**2.6559**	**2.3223**	**1.3304**	**0.6349**	**22.7020**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0278	0.0282	0.0362	0.0441	0.0404	0.0544	0.0551	0.0532	0.0501	0.0540	0.0415	0.0231		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9962	0.9965	0.9956	0.9941	0.9942	0.9920	0.9916	0.9908	0.9923	0.9940	0.9955	0.9963		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96		Calculated Using Equation 1-3
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.77	509.09	515.30	523.51	523.11	531.93	533.33	535.81	530.93	523.78	516.31	511.11		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.08	509.52	515.94	524.47	524.15	533.24	534.62	536.95	531.83	524.46	516.72	511.35		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0278**	**0.0282**	**0.0362**	**0.0441**	**0.0404**	**0.0544**	**0.0551**	**0.0532**	**0.0501**	**0.0540**	**0.0415**	**0.0231**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.18	14.32	18.61	22.99	21.04	28.77	29.22	28.33	26.48	28.19	21.36	11.77		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0032	0.0039	0.0051	0.0051	0.0066	0.0069	0.0077	0.0065	0.0049	0.0040	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0042	0.0056	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0082	0.0059	0.0045		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.77	509.09	515.30	523.51	523.11	531.93	533.33	535.81	530.93	523.78	516.31	511.11		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.23	505.51	510.65	517.76	517.85	524.74	526.03	528.73	524.31	516.73	510.97	508.17		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.31	512.67	519.95	529.26	528.37	539.12	540.63	542.89	537.55	530.83	521.65	514.05		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9962**	**0.9965**	**0.9956**	**0.9941**	**0.9942**	**0.9920**	**0.9916**	**0.9908**	**0.9923**	**0.9940**	**0.9955**	**0.9963**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**12.0975**	**9.9067**	**13.7296**	**17.7287**	**18.0647**	**23.6044**	**25.5609**	**27.7612**	**22.8425**	**18.5015**	**13.7808**	**11.8126**	**215.3913**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	4,161,645	3,758,905	4,161,645	4,027,398	4,161,645	4,027,398	4,161,645	4,161,645	4,027,398	4,161,645	4,027,398	4,161,645		Specified monthly throughput
N	Annual Turnovers	514.01	514.01	514.01	514.01	514.01	514.01	514.01	514.01	514.01	514.01	514.01	514.01		Calculated Using Equation 1-36
K_N	Turnover Factor	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250	0.2250		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**12.880**	**10.557**	**14.887**	**19.545**	**19.759**	**26.580**	**28.824**	**31.180**	**25.498**	**20.824**	**15.111**	**12.448**	**238.093**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	12.880	10.557	14.887	19.545	19.759	26.580	28.824	31.180	25.498	20.824	15.111	12.448	238.093	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	1.584	1.317	1.797	2.259	2.289	2.939	3.164	3.379	2.834	2.403	1.814	1.536	27.315	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.497	0.418	0.556	0.676	0.686	0.851	0.911	0.963	0.824	0.719	0.559	0.484	8.143	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.354	0.298	0.395	0.478	0.485	0.598	0.639	0.675	0.579	0.508	0.397	0.345	5.750	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.080	0.066	0.092	0.118	0.119	0.157	0.170	0.183	0.151	0.126	0.093	0.077	1.431	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0494	0.0404	0.0572	0.0754	0.0762	0.1026	0.1113	0.1203	0.0984	0.0803	0.0581	0.0477	0.9172	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.019	0.015	0.023	0.032	0.032	0.046	0.051	0.056	0.044	0.034	0.023	0.018	0.395	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.51	0.42	0.57	0.72	0.73	0.93	1.00	1.06	0.90	0.76	0.58	0.49	8.68	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.096	0.078	0.112	0.151	0.153	0.210	0.229	0.249	0.201	0.161	0.114	0.093	1.848	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	0.15	0.12	0.17	0.22	0.22	0.30	0.32	0.34	0.29	0.24	0.17	0.14	2.69	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	0.12	0.10	0.14	0.18	0.18	0.24	0.26	0.28	0.23	0.19	0.14	0.12	2.17	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (p) Losses (lb/month)	0.161	0.133	0.185	0.238	0.241	0.317	0.342	0.367	0.305	0.253	0.187	0.156	2.885	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-700 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.52121**	**0.47266**	**0.59190**	**0.79024**	**0.77936**	**1.05281**	**1.10325**	**1.19787**	**1.01805**	**0.79767**	**0.61363**	**0.50886**	**1.19787**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00409	0.00369	0.00467	0.00634	0.00624	0.00858	0.00901	0.00983	0.00828	0.00640	0.00485	0.00398		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.521**	**0.473**	**0.592**	**0.790**	**0.779**	**1.053**	**1.103**	**1.198**	**1.018**	**0.798**	**0.614**	**0.509**	**1.198**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.521	0.473	0.592	0.790	0.779	1.053	1.103	1.198	1.018	0.798	0.614	0.509	1.198	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.064	0.059	0.071	0.091	0.090	0.116	0.121	0.130	0.113	0.092	0.074	0.063	0.130	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.020	0.019	0.022	0.027	0.027	0.034	0.035	0.037	0.033	0.028	0.023	0.020	0.037	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.014	0.013	0.016	0.019	0.019	0.024	0.024	0.026	0.023	0.019	0.016	0.014	0.026	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007	0.006	0.005	0.004	0.003	0.007	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00200	0.00181	0.00227	0.00305	0.00301	0.00406	0.00426	0.00462	0.00393	0.00308	0.00236	0.00195	0.00462	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.004	0.003	0.004	0.006	0.006	0.008	0.009	0.010	0.008	0.006	0.005	0.004	0.010	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.007	0.006	0.007	0.010	0.009	0.013	0.013	0.014	0.012	0.010	0.008	0.006	0.014	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -846 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	24.00	Tank Volume (bbl):	3,000.00
Net Throughput (bbl/yr):	13,706,224	Turnovers Per Year:	5,765.75
Maximum Pumping Rate (bbl/hr):	1,994.583		
Shell Height (ft):	32	Maximum Liquid Height (ft):	30.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{v_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Phenol Skim (Wastewater)**	**January**	**52.08**	**48.49**	**55.67**	**51.78**	**0.1885**	**0.16489**	**0.21502**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00120	78.11	78.11	0.50%	2.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1874	0.1639	0.2138	18.0153	18.0153	98.00%	97.39%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**February**	**49.41**	**45.79**	**53.03**	**49.00**	**0.1707**	**0.14889**	**0.19521**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0010	0.00090	0.00111	78.11	78.11	0.50%	2.48%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1696	0.1479	0.1940	18.0153	18.0153	98.00%	97.33%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**March**	**55.60**	**50.90**	**60.30**	**54.98**	**0.2145**	**0.18043**	**0.25400**	**18.00**	**18.38**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00104	0.00136	78.11	78.11	0.50%	2.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2132	0.1793	0.2526	18.0153	18.0153	98.00%	97.45%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**April**	**63.80**	**58.00**	**69.60**	**62.87**	**0.2875**	**0.23396**	**0.35133**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00175	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2859	0.2326	0.3495	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**May**	**63.40**	**58.11**	**68.69**	**62.40**	**0.2834**	**0.23481**	**0.34066**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00171	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2819	0.2335	0.3388	18.0153	18.0153	98.00%	97.59%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**June**	**72.21**	**64.96**	**79.46**	**70.94**	**0.3840**	**0.29939**	**0.48874**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00155	0.00226	78.11	78.11	0.50%	2.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3820	0.2977	0.4863	18.0153	18.0153	98.00%	97.73%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**July**	**73.61**	**66.25**	**80.97**	**72.37**	**0.4026**	**0.31309**	**0.51351**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00160	0.00235	78.11	78.11	0.50%	2.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4005	0.3114	0.5110	18.0153	18.0153	98.00%	97.76%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**August**	**76.10**	**68.96**	**83.24**	**75.01**	**0.4375**	**0.34373**	**0.55276**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0021	0.00172	0.00249	78.11	78.11	0.50%	2.020783%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.004425%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.007255%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.174863%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4353	0.3419	0.5501	18.0153	18.0153	98.00%	97.792673%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-846 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Mixture/Product	**Phenol Skim (Wastewater)**	**September**	**71.22**	**64.53**	**77.91**	**70.36**	**0.3713**	**0.29491**	**0.46448**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0018	0.00153	0.00217	78.11	78.11	0.50%	2.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3694	0.2933	0.4622	18.0153	18.0153	98.00%	97.72%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**October**	**64.08**	**56.95**	**71.21**	**63.43**	**0.2903**	**0.22519**	**0.37126**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00124	0.00183	78.11	78.11	0.50%	2.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2887	0.2239	0.3693	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**November**	**56.63**	**51.22**	**62.04**	**56.23**	**0.2226**	**0.18257**	**0.27021**	**18.00**	**18.37**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00105	0.00143	78.11	78.11	0.50%	2.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2213	0.1815	0.2687	18.0153	18.0153	98.00%	97.47%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**December**	**51.43**	**48.45**	**54.41**	**51.20**	**0.1840**	**0.16463**	**0.20537**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00115	78.11	78.11	0.50%	2.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1829	0.1636	0.2041	18.0153	18.0153	98.00%	97.37%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-846 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.0505**	**3.3891**	**5.9113**	**9.0061**	**8.4021**	**14.2829**	**15.5776**	**16.1750**	**12.8331**	**11.5602**	**6.8027**	**3.2963**	**111.2870**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0009	0.0009	0.0012	0.0013	0.0014	0.0012	0.0009	0.0007	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0315	0.0316	0.0416	0.0524	0.0478	0.0677	0.0692	0.0680	0.0622	0.0646	0.0480	0.0261		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8548	0.8667	0.8381	0.7943	0.7966	0.7430	0.7338	0.7173	0.7493	0.7927	0.8329	0.8578		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62		Calculated Using Equation 1-3
D	Tank Diameter (ft)	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0009**	**0.0009**	**0.0012**	**0.0013**	**0.0014**	**0.0012**	**0.0009**	**0.0007**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.75	509.08	515.27	523.47	523.07	531.88	533.28	535.77	530.89	523.75	516.30	511.10		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.06	509.48	515.89	524.39	524.06	533.14	534.52	536.86	531.76	524.41	516.69	511.33		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0315**	**0.0316**	**0.0416**	**0.0524**	**0.0478**	**0.0677**	**0.0692**	**0.0680**	**0.0622**	**0.0646**	**0.0480**	**0.0261**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.36	14.48	18.80	23.18	21.18	28.99	29.44	28.57	26.75	28.54	21.65	11.93		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.05	0.07	0.12	0.11	0.19	0.20	0.21	0.17	0.15	0.09	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1649	0.1489	0.1804	0.2340	0.2348	0.2994	0.3131	0.3437	0.2949	0.2252	0.1826	0.1646		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2150	0.1952	0.2540	0.3513	0.3407	0.4887	0.5135	0.5528	0.4645	0.3713	0.2702	0.2054		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.75	509.08	515.27	523.47	523.07	531.88	533.28	535.77	530.89	523.75	516.30	511.10		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.16	505.46	510.57	517.67	517.78	524.63	525.92	528.63	524.20	516.62	510.89	508.12		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.34	512.70	519.97	529.27	528.36	539.13	540.64	542.91	537.58	530.88	521.71	514.08		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8548**	**0.8667**	**0.8381**	**0.7943**	**0.7966**	**0.7430**	**0.7338**	**0.7173**	**0.7493**	**0.7927**	**0.8329**	**0.8578**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**708.4656**	**582.5866**	**799.6645**	**1,019.2415**	**1,039.2373**	**1,337.8164**	**1,445.2156**	**1,563.3317**	**1,297.2097**	**1,063.5325**	**801.9847**	**692.6782**	**12,350.9642**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	48,891,791	44,160,327	48,891,791	47,314,636	48,891,791	47,314,636	48,891,791	48,891,791	47,314,636	48,891,791	47,314,636	48,891,791		Specified monthly throughput
N	Annual Turnovers	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75	5,765.75		Calculated Using Equation 1-36
K_N	Turnover Factor	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719	0.1719		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**712.516**	**585.976**	**805.576**	**1,028.248**	**1,047.639**	**1,352.099**	**1,460.793**	**1,579.507**	**1,310.043**	**1,075.093**	**808.787**	**695.974**	**12,462.251**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	18.631	15.630	20.526	24.702	25.239	30.641	32.790	34.865	29.889	25.776	20.454	18.287	297.432	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	18.612	15.616	20.503	24.666	25.203	30.585	32.729	34.795	29.837	25.739	20.430	18.269	296.985	Sum of HAP Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	693.8847	570.3453	785.0494	1,003.5456	1,022.4004	1,321.4584	1,428.0027	1,544.6418	1,280.1536	1,049.3163	788.3333	677.6877	12,164.8192	Sum of Non-Pollutant Component Emissions
L_{Ti}	Benzene Losses (lb/month)	17.320	14.554	19.041	22.797	23.299	28.124	30.069	31.918	27.452	23.784	18.962	17.006	274.326	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-o) Losses (lb/month)	0.019	0.015	0.023	0.036	0.036	0.055	0.062	0.070	0.053	0.037	0.024	0.018	0.447	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.03	0.03	0.04	0.06	0.06	0.09	0.10	0.11	0.09	0.06	0.04	0.03	0.76	Calculated using Equations 40-1 through 40-9
L_{Ti}	Water Losses (lb/month)	693.885	570.345	785.049	1,003.546	1,022.400	1,321.458	1,428.003	1,544.642	1,280.154	1,049.316	788.333	677.688	12,164.819	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.26	1.04	1.42	1.81	1.84	2.37	2.56	2.76	2.30	1.89	1.43	1.23	21.90	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-846 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**7.06792**	**6.43609**	**7.98258**	**10.51952**	**10.38134**	**13.81582**	**14.44290**	**15.61874**	**13.38666**	**10.61720**	**8.26887**	**6.90935**	**15.61874**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.18850	0.17068	0.21447	0.28745	0.28344	0.38400	0.40255	0.43748	0.37133	0.29029	0.22263	0.18401		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**7.068**	**6.436**	**7.983**	**10.520**	**10.381**	**13.816**	**14.443**	**15.619**	**13.387**	**10.617**	**8.269**	**6.909**	**15.619**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.185	0.172	0.203	0.253	0.250	0.313	0.324	0.345	0.305	0.255	0.209	0.182	0.345	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.185	0.172	0.203	0.252	0.250	0.313	0.324	0.344	0.305	0.254	0.209	0.181	0.344	Sum of HAP Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	6.88310	6.26441	7.77918	10.26680	10.13124	13.50273	14.11870	15.27398	13.08124	10.36265	8.05975	6.72781	15.27398	Sum of Non-Pollutant Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.172	0.160	0.189	0.233	0.231	0.287	0.297	0.316	0.281	0.235	0.194	0.169	0.316	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-o) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	6.883	6.264	7.779	10.267	10.131	13.503	14.119	15.274	13.081	10.363	8.060	6.728	15.274	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -847 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	26.00	Tank Volume (bbl):	3,000.00
Net Throughput (bbl/yr):	13,706,224	Turnovers Per Year:	4,751.75
Maximum Pumping Rate (bbl/hr):	1,994.583		
Shell Height (ft):	32	Maximum Liquid Height (ft):	31.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.81
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{v_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Phenol Skim (Wastewater)**	**January**	**52.09**	**48.52**	**55.66**	**51.78**	**0.1886**	**0.16511**	**0.21490**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00119	78.11	78.11	0.50%	2.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1874	0.1641	0.2136	18.0153	18.0153	98.00%	97.39%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**February**	**49.42**	**45.82**	**53.02**	**49.00**	**0.1707**	**0.14908**	**0.19513**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0010	0.00090	0.00111	78.11	78.11	0.50%	2.48%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1697	0.1481	0.1940	18.0153	18.0153	98.00%	97.33%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**March**	**55.62**	**50.95**	**60.29**	**54.98**	**0.2146**	**0.18073**	**0.25395**	**18.00**	**18.38**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00104	0.00136	78.11	78.11	0.50%	2.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2134	0.1796	0.2525	18.0153	18.0153	98.00%	97.45%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**April**	**63.82**	**58.05**	**69.59**	**62.87**	**0.2877**	**0.23435**	**0.35126**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00175	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2861	0.2330	0.3494	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**May**	**63.42**	**58.14**	**68.70**	**62.40**	**0.2836**	**0.23514**	**0.34067**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00171	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2821	0.2338	0.3389	18.0153	18.0153	98.00%	97.59%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**June**	**72.24**	**65.02**	**79.46**	**70.94**	**0.3844**	**0.30001**	**0.48875**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00155	0.00226	78.11	78.11	0.50%	2.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3824	0.2984	0.4863	18.0153	18.0153	98.00%	97.73%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**July**	**73.64**	**66.31**	**80.97**	**72.37**	**0.4030**	**0.31376**	**0.51349**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00160	0.00235	78.11	78.11	0.50%	2.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4009	0.3121	0.5110	18.0153	18.0153	98.00%	97.76%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**August**	**76.12**	**69.01**	**83.23**	**75.01**	**0.4378**	**0.34437**	**0.55251**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0021	0.00172	0.00249	78.11	78.11	0.50%	2.020485%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.004427%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.007257%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.174861%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4356	0.3425	0.5498	18.0153	18.0153	98.00%	97.792971%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-847 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Mixture/Product	**Phenol Skim (Wastewater)**	**September**	**71.24**	**64.59**	**77.89**	**70.36**	**0.3716**	**0.29550**	**0.46422**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0018	0.00153	0.00217	78.11	78.11	0.50%	2.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3696	0.2939	0.4619	18.0153	18.0153	98.00%	97.72%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**October**	**64.10**	**57.01**	**71.19**	**63.43**	**0.2905**	**0.22574**	**0.37091**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00124	0.00183	78.11	78.11	0.50%	2.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2889	0.2244	0.3690	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**November**	**56.63**	**51.26**	**62.00**	**56.23**	**0.2226**	**0.18284**	**0.26983**	**18.00**	**18.37**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00105	0.00143	78.11	78.11	0.50%	2.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2213	0.1817	0.2683	18.0153	18.0153	98.00%	97.47%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**December**	**51.43**	**48.47**	**54.39**	**51.20**	**0.1840**	**0.16477**	**0.20521**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00115	78.11	78.11	0.50%	2.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1829	0.1637	0.2040	18.0153	18.0153	98.00%	97.37%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-847 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.6077**	**3.8576**	**6.7401**	**10.2902**	**9.6083**	**16.3547**	**17.8385**	**18.5163**	**14.6667**	**13.1803**	**7.7375**	**3.7472**	**127.1451**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0009	0.0009	0.0012	0.0013	0.0014	0.0012	0.0009	0.0007	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0313	0.0314	0.0413	0.0522	0.0476	0.0674	0.0689	0.0676	0.0619	0.0642	0.0476	0.0259		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8583	0.8699	0.8418	0.7988	0.8011	0.7482	0.7392	0.7229	0.7545	0.7972	0.8369	0.8612		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30		Calculated Using Equation 1-3
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75		See 'Tank Identification and Physical Characteristics' table above
H_{RD}	Roof Outage (ft)	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0009**	**0.0009**	**0.0012**	**0.0013**	**0.0014**	**0.0012**	**0.0009**	**0.0007**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.76	509.09	515.29	523.49	523.09	531.91	533.31	535.79	530.91	523.77	516.30	511.10		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.07	509.50	515.92	524.43	524.11	533.20	534.58	536.91	531.80	524.44	516.71	511.34		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0313**	**0.0314**	**0.0413**	**0.0522**	**0.0476**	**0.0674**	**0.0689**	**0.0676**	**0.0619**	**0.0642**	**0.0476**	**0.0259**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.26	14.39	18.70	23.08	21.10	28.87	29.32	28.44	26.60	28.35	21.49	11.84		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.05	0.07	0.12	0.11	0.19	0.20	0.21	0.17	0.15	0.09	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1651	0.1491	0.1807	0.2344	0.2351	0.3000	0.3138	0.3444	0.2955	0.2257	0.1828	0.1648		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2149	0.1951	0.2540	0.3513	0.3407	0.4888	0.5135	0.5525	0.4642	0.3709	0.2698	0.2052		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.76	509.09	515.29	523.49	523.09	531.91	533.31	535.79	530.91	523.77	516.30	511.10		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.19	505.49	510.62	517.72	517.81	524.69	525.98	528.68	524.26	516.68	510.93	508.14		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.33	512.69	519.96	529.26	528.37	539.13	540.64	542.90	537.56	530.86	521.67	514.06		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8583**	**0.8699**	**0.8418**	**0.7988**	**0.8011**	**0.7482**	**0.7392**	**0.7229**	**0.7545**	**0.7972**	**0.8369**	**0.8612**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**713.2861**	**586.5477**	**805.3688**	**1,026.4615**	**1,046.5938**	**1,347.6740**	**1,455.8589**	**1,574.3267**	**1,306.3754**	**1,071.0905**	**807.1379**	**697.1390**	**12,437.8601**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	48,891,791	44,160,327	48,891,791	47,314,636	48,891,791	47,314,636	48,891,791	48,891,791	47,314,636	48,891,791	47,314,636	48,891,791		Specified monthly throughput
N	Annual Turnovers	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75	4,751.75		Calculated Using Equation 1-36
K_N	Turnover Factor	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730	0.1730		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**717.894**	**590.405**	**812.109**	**1,036.752**	**1,056.202**	**1,364.029**	**1,473.697**	**1,592.843**	**1,321.042**	**1,084.271**	**814.875**	**700.886**	**12,565.005**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	18.771	15.747	20.690	24.903	25.442	30.905	33.073	35.155	30.136	25.993	20.608	18.416	299.838	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	18.752	15.733	20.666	24.867	25.406	30.849	33.011	35.084	30.083	25.955	20.584	18.398	299.387	Sum of HAP Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	699.1232	574.6579	791.4191	1,011.8490	1,030.7604	1,333.1238	1,440.6239	1,557.6884	1,290.9059	1,058.2780	794.2673	682.4703	12,265.1671	Sum of Non-Pollutant Component Emissions
L_{Ti}	Benzene Losses (lb/month)	17.449	14.662	19.192	22.982	23.485	28.366	30.328	32.183	27.678	23.984	19.104	17.126	276.541	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-o) Losses (lb/month)	0.019	0.015	0.023	0.036	0.036	0.056	0.062	0.071	0.053	0.038	0.024	0.018	0.451	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.03	0.03	0.04	0.06	0.06	0.09	0.10	0.12	0.09	0.06	0.04	0.03	0.77	Calculated using Equations 40-1 through 40-9
L_{Ti}	Water Losses (lb/month)	699.123	574.658	791.419	1,011.849	1,030.760	1,333.124	1,440.624	1,557.688	1,290.906	1,058.278	794.267	682.470	12,265.167	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.27	1.04	1.43	1.82	1.86	2.39	2.58	2.79	2.32	1.91	1.44	1.24	22.08	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-847 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**7.07038**	**6.43836**	**7.98805**	**10.52647**	**10.38822**	**13.82900**	**14.45659**	**15.62848**	**13.39520**	**10.62422**	**8.26887**	**6.90935**	**15.62848**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.18857	0.17074	0.21462	0.28765	0.28364	0.38439	0.40296	0.43777	0.37158	0.29049	0.22263	0.18401		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**7.070**	**6.438**	**7.988**	**10.526**	**10.388**	**13.829**	**14.457**	**15.628**	**13.395**	**10.624**	**8.269**	**6.909**	**15.628**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.185	0.172	0.204	0.253	0.250	0.313	0.324	0.345	0.306	0.255	0.209	0.182	0.345	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.185	0.172	0.203	0.252	0.250	0.313	0.324	0.344	0.305	0.254	0.209	0.181	0.344	Sum of HAP Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	6.88552	6.26664	7.78454	10.27363	10.13798	13.51567	14.13215	15.28356	13.08962	10.36953	8.05975	6.72781	15.28356	Sum of Non-Pollutant Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.172	0.160	0.189	0.233	0.231	0.288	0.298	0.316	0.281	0.235	0.194	0.169	0.316	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-o) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	6.886	6.267	7.785	10.274	10.138	13.516	14.132	15.284	13.090	10.370	8.060	6.728	15.284	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	176.00	Tank Volume (bbl):	216,600.00
Net Throughput (bbl/yr):	50,000,000	Turnovers Per Year:	230.76
Maximum Pumping Rate (bbl/hr):	12,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Crude Oil RVP 10.0**	**January**	**52.60**	--	--	**52.33**	**6.5836**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0112	--	--	78.11	78.11	0.45%	0.27%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0170	--	--	84.16	84.16	0.70%	0.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0930	--	--	86.18	86.18	2.46%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0052	--	--	92.14	92.14	0.88%	0.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0019	--	--	106.17	106.17	1.42%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**February**	**50.11**	--	--	**49.74**	**6.3088**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0105	--	--	78.11	78.11	0.45%	0.26%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.70%	0.42%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0869	--	--	86.18	86.18	2.46%	2.38%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0048	--	--	92.14	92.14	0.88%	0.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0018	--	--	106.17	106.17	1.42%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**March**	**56.67**	--	--	**56.11**	**7.0506**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0126	--	--	78.11	78.11	0.45%	0.28%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0191	--	--	84.16	84.16	0.70%	0.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1037	--	--	86.18	86.18	2.46%	2.53%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0059	--	--	92.14	92.14	0.88%	0.15%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0022	--	--	106.17	106.17	1.42%	0.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**April**	**65.39**	--	--	**64.56**	**8.1390**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0160	--	--	78.11	78.11	0.45%	0.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0241	--	--	84.16	84.16	0.70%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1300	--	--	86.18	86.18	2.46%	2.75%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0077	--	--	92.14	92.14	0.88%	0.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-867 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0030	--	--	106.17	106.17	1.42%	0.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**May**	**65.11**	**--**	**--**	**64.22**	**8.1027**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0159	--	--	78.11	78.11	0.45%	0.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0239	--	--	84.16	84.16	0.70%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1291	--	--	86.18	86.18	2.46%	2.75%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0076	--	--	92.14	92.14	0.88%	0.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0030	--	--	106.17	106.17	1.42%	0.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**June**	**74.38**	**--**	**--**	**73.25**	**9.3903**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0204	--	--	78.11	78.11	0.45%	0.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0304	--	--	84.16	84.16	0.70%	0.55%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	0.35%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1625	--	--	86.18	86.18	2.46%	2.98%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0101	--	--	92.14	92.14	0.88%	0.20%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.33%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0041	--	--	106.17	106.17	1.42%	0.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**July**	**75.74**	**--**	**--**	**74.64**	**9.5924**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0211	--	--	78.11	78.11	0.45%	0.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0315	--	--	84.16	84.16	0.70%	0.55%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0012	--	--	106.17	106.17	0.35%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1680	--	--	86.18	86.18	2.46%	3.02%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0105	--	--	92.14	92.14	0.88%	0.20%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.33%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0043	--	--	106.17	106.17	1.42%	0.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**August**	**77.98**	**--**	**--**	**77.00**	**9.9300**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0223	--	--	78.11	78.11	0.45%	0.35%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0333	--	--	84.16	84.16	0.70%	0.56%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	0.35%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1773	--	--	86.18	86.18	2.46%	3.08%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0001	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0112	--	--	92.14	92.14	0.88%	0.21%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.33%	0.01%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0046	--	--	106.17	106.17	1.42%	0.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**September**	**72.71**	**--**	**--**	**71.94**	**9.1476**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0195	--	--	78.11	78.11	0.45%	0.33%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0292	--	--	84.16	84.16	0.70%	0.54%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1560	--	--	86.18	86.18	2.46%	2.94%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0096	--	--	92.14	92.14	0.88%	0.19%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0002	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0039	--	--	106.17	106.17	1.42%	0.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**October**	**65.21**	**--**	**--**	**64.63**	**8.1156**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0160	--	--	78.11	78.11	0.45%	0.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0240	--	--	84.16	84.16	0.70%	0.50%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1294	--	--	86.18	86.18	2.46%	2.75%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0077	--	--	92.14	92.14	0.88%	0.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0030	--	--	106.17	106.17	1.42%	0.08%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**November**	**57.30**	**--**	**--**	**56.95**	**7.1258**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0128	--	--	78.11	78.11	0.45%	0.28%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0194	--	--	84.16	84.16	0.70%	0.46%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.1054	--	--	86.18	86.18	2.46%	2.55%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-867 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Toluene						0.0060	--	--	92.14	92.14	0.88%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0023	--	--	106.17	106.17	1.42%	0.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Crude Oil RVP 10.0**	**December**	**51.82**	**--**	**--**	**51.62**	**6.4965**	**--**	**--**	**207.00**	**50.00**	**--**	**--**	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0110	--	--	78.11	78.11	0.45%	0.26%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.06%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0166	--	--	84.16	84.16	0.70%	0.43%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.35%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0911	--	--	86.18	86.18	2.46%	2.42%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.22%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Phenol						0.0000	--	--	94.11	94.11	0.32%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Toluene						0.0050	--	--	92.14	92.14	0.88%	0.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0001	--	--	120.19	120.19	0.33%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0019	--	--	106.17	106.17	1.42%	0.06%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-867 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**112.68**	**122.41**	**135.89**	**189.40**	**236.36**	**259.84**	**276.42**	**291.74**	**223.02**	**153.54**	**112.41**	**103.61**	**2,217.31**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.1470	0.1389	0.1614	0.1984	0.1971	0.2484	0.2574	0.2732	0.2379	0.1975	0.1638	0.1444		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	6.5836	6.3088	7.0506	8.1390	8.1027	9.3903	9.5924	9.9300	9.1476	8.1156	7.1258	6.4965		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**35.12**	**33.19**	**40.08**	**51.05**	**57.31**	**66.60**	**71.10**	**75.27**	**60.73**	**47.45**	**36.71**	**33.59**	**608.19**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.1470	0.1389	0.1614	0.1984	0.1971	0.2484	0.2574	0.2732	0.2379	0.1975	0.1638	0.1444		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	140.63	155.77	146.18	156.53	171.20	163.12	162.62	162.21	155.27	141.43	136.32	136.95		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**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**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**969.28**	**875.48**	**969.28**	**938.01**	**969.28**	**938.01**	**969.28**	**969.28**	**938.01**	**969.28**	**938.01**	**969.28**	**11,412.44**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	4,246,575	3,835,616	4,246,575	4,109,589	4,246,575	4,109,589	4,246,575	4,246,575	4,109,589	4,246,575	4,109,589	4,246,575		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	176	176	176	176	176	176	176	176	176	176	176	176		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**1,117.08**	**1,031.07**	**1,145.24**	**1,178.46**	**1,262.94**	**1,264.45**	**1,316.80**	**1,336.29**	**1,221.76**	**1,170.27**	**1,087.13**	**1,106.48**	**14,237.95**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	1,117.08	1,031.07	1,145.24	1,178.46	1,262.94	1,264.45	1,316.80	1,336.29	1,221.76	1,170.27	1,087.13	1,106.48	14,237.95	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	63.98	58.32	65.03	65.76	69.43	69.61	72.47	73.47	67.90	66.35	62.32	63.64	798.28	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	4.72	4.31	4.81	4.92	5.22	5.29	5.52	5.61	5.13	4.94	4.60	4.69	59.76	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.58	0.53	0.58	0.56	0.58	0.56	0.58	0.58	0.56	0.58	0.56	0.58	6.85	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	7.43	6.79	7.59	7.76	8.24	8.35	8.70	8.86	8.09	7.78	7.25	7.38	94.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	3.38	3.05	3.39	3.30	3.42	3.33	3.45	3.45	3.32	3.40	3.27	3.38	40.13	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	27.47	25.26	28.33	29.72	31.94	32.84	34.37	35.17	31.45	29.40	26.91	27.19	360.03	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	2.12	1.92	2.12	2.06	2.12	2.06	2.12	2.12	2.06	2.12	2.05	2.12	25.00	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	3.13	2.83	3.13	3.03	3.13	3.03	3.13	3.13	3.03	3.13	3.03	3.13	36.88	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	8.72	7.90	8.78	8.66	9.02	8.88	9.21	9.27	8.78	8.86	8.47	8.71	105.26	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	3.16	2.86	3.17	3.07	3.17	3.07	3.18	3.18	3.07	3.17	3.06	3.16	37.33	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	13.86	12.52	13.88	13.51	13.99	13.62	14.09	14.12	13.57	13.92	13.42	13.85	164.36	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**2.94**	**2.97**	**2.98**	**3.07**	**3.13**	**3.19**	**3.21**	**3.23**	**3.13**	**3.01**	**2.95**	**2.92**	**3.23**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	**2.74**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.15**	**0.18**	**0.18**	**0.26**	**0.32**	**0.36**	**0.37**	**0.39**	**0.31**	**0.21**	**0.16**	**0.14**	**0.39**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.05**	**0.05**	**0.05**	**0.07**	**0.08**	**0.09**	**0.10**	**0.10**	**0.08**	**0.06**	**0.05**	**0.05**	**0.10**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**2.94**	**2.97**	**2.98**	**3.07**	**3.13**	**3.19**	**3.21**	**3.23**	**3.13**	**3.01**	**2.95**	**2.92**	**3.23**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	2.94	2.97	2.98	3.07	3.13	3.19	3.21	3.23	3.13	3.01	2.95	2.92	3.23	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.17	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.18	0.18	0.17	0.17	0.19	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Biphenyl Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12	0.81	1
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	-	-	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	3
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	28
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.14	0.13	0.14	56
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-868 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	134.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	115.39
Maximum Pumping Rate (bbl/hr):	3,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Jet Naphtha**	**January**	**52.61**	--	--	**52.35**	**1.0797**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0146	--	--	78.11	78.11	1.00%	1.32%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0175	--	--	84.16	84.16	1.24%	1.70%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0328	--	--	86.18	86.18	1.50%	3.28%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0109	--	--	92.14	92.14	3.20%	1.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0025	--	--	106.17	106.17	3.20%	0.31%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**February**	**50.11**	--	--	**49.76**	**1.0216**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0136	--	--	78.11	78.11	1.00%	1.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0163	--	--	84.16	84.16	1.24%	1.68%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0307	--	--	86.18	86.18	1.50%	3.24%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0101	--	--	92.14	92.14	3.20%	1.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0023	--	--	106.17	106.17	3.20%	0.30%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**March**	**56.68**	--	--	**56.14**	**1.1801**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0164	--	--	78.11	78.11	1.00%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0196	--	--	84.16	84.16	1.24%	1.74%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0366	--	--	86.18	86.18	1.50%	3.34%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0124	--	--	92.14	92.14	3.20%	1.21%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0029	--	--	106.17	106.17	3.20%	0.33%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**April**	**65.40**	--	--	**64.61**	**1.4217**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0209	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0248	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0459	--	--	86.18	86.18	1.50%	3.48%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0163	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**May**	**65.13**	--	--	**64.27**	**1.4135**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0207	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0246	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0456	--	--	86.18	86.18	1.50%	3.47%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0161	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**June**	**74.40**	--	--	**73.31**	**1.7115**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-868 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Benzene						0.0265	--	--	78.11	78.11	1.00%	1.51%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0312	--	--	84.16	84.16	1.24%	1.92%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0574	--	--	86.18	86.18	1.50%	3.61%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0213	--	--	92.14	92.14	3.20%	1.43%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0053	--	--	106.17	106.17	3.20%	0.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**July**	**75.76**	--	--	**74.69**	**1.7594**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0274	--	--	78.11	78.11	1.00%	1.52%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0323	--	--	84.16	84.16	1.24%	1.93%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	0.50%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0594	--	--	86.18	86.18	1.50%	3.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0221	--	--	92.14	92.14	3.20%	1.45%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0056	--	--	106.17	106.17	3.20%	0.42%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**August**	**77.99**	--	--	**77.05**	**1.8400**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0290	--	--	78.11	78.11	1.00%	1.54%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0342	--	--	84.16	84.16	1.24%	1.96%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	0.50%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0626	--	--	86.18	86.18	1.50%	3.67%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0236	--	--	92.14	92.14	3.20%	1.48%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0060	--	--	106.17	106.17	3.20%	0.43%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**September**	**72.72**	--	--	**71.98**	**1.6542**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0253	--	--	78.11	78.11	1.00%	1.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0299	--	--	84.16	84.16	1.24%	1.90%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0009	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0551	--	--	86.18	86.18	1.50%	3.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0203	--	--	92.14	92.14	3.20%	1.41%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0050	--	--	106.17	106.17	3.20%	0.40%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**October**	**65.22**	--	--	**64.66**	**1.4163**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0208	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0246	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0457	--	--	86.18	86.18	1.50%	3.48%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0162	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**November**	**57.31**	--	--	**56.97**	**1.1964**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0167	--	--	78.11	78.11	1.00%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0199	--	--	84.16	84.16	1.24%	1.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0372	--	--	86.18	86.18	1.50%	3.35%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0127	--	--	92.14	92.14	3.20%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0030	--	--	106.17	106.17	3.20%	0.33%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**December**	**51.82**	--	--	**51.63**	**1.0612**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0143	--	--	78.11	78.11	1.00%	1.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0171	--	--	84.16	84.16	1.24%	1.69%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0322	--	--	86.18	86.18	1.50%	3.26%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0106	--	--	92.14	92.14	3.20%	1.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0024	--	--	106.17	106.17	3.20%	0.30%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-868 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**44.42**	**48.23**	**53.52**	**73.76**	**92.10**	**98.35**	**103.96**	**108.45**	**84.99**	**59.81**	**44.25**	**40.84**	**852.69**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0190	0.0180	0.0209	0.0254	0.0252	0.0309	0.0318	0.0333	0.0298	0.0253	0.0212	0.0187		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	1.0797	1.0216	1.1801	1.4217	1.4135	1.7115	1.7594	1.8400	1.6542	1.4163	1.1964	1.0612		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**20.55**	**21.54**	**24.27**	**32.94**	**41.73**	**44.01**	**46.50**	**48.49**	**37.98**	**27.57**	**20.93**	**19.24**	**385.75**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0190	0.0180	0.0209	0.0254	0.0252	0.0309	0.0318	0.0333	0.0298	0.0253	0.0212	0.0187		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	158.93	195.38	171.12	197.48	243.55	216.83	215.30	214.03	194.00	160.61	150.31	151.54		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**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**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**57.38**	**51.83**	**57.38**	**55.53**	**57.38**	**55.53**	**57.38**	**57.38**	**55.53**	**57.38**	**55.53**	**57.38**	**675.58**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	849,315	767,123	849,315	821,918	849,315	821,918	849,315	849,315	821,918	849,315	821,918	849,315		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40		From Chemical Properties Database
D	Tank Diameter (ft)	134	134	134	134	134	134	134	134	134	134	134	134		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**122.35**	**121.60**	**135.17**	**162.23**	**191.21**	**197.88**	**207.84**	**214.32**	**178.49**	**144.76**	**120.71**	**117.46**	**1,914.02**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	122.35	121.60	135.17	162.23	191.21	197.88	207.84	214.32	178.49	144.76	120.71	117.46	1,914.02	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	9.71	9.38	10.63	12.66	14.64	15.57	16.42	17.02	14.12	11.55	9.67	9.39	150.76	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	1.43	1.42	1.63	2.08	2.49	2.70	2.86	2.99	2.39	1.82	1.44	1.36	24.64	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.81	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	1.82	1.81	2.07	2.64	3.16	3.42	3.62	3.78	3.03	2.31	1.83	1.73	31.23	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.32	0.30	0.33	0.35	0.37	0.38	0.40	0.41	0.37	0.34	0.32	0.32	4.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	2.99	3.04	3.46	4.54	5.51	5.98	6.33	6.62	5.25	3.90	3.02	2.82	53.44	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.27	0.24	0.27	0.26	0.27	0.26	0.27	0.27	0.26	0.27	0.26	0.27	3.18	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	2.59	2.45	2.78	3.18	3.60	3.81	4.02	4.15	3.51	2.99	2.57	2.53	38.19	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	2.04	1.87	2.09	2.17	2.33	2.37	2.47	2.51	2.27	2.16	1.99	2.02	26.28	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-868 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.29**	**0.31**	**0.31**	**0.35**	**0.38**	**0.40**	**0.40**	**0.41**	**0.37**	**0.32**	**0.29**	**0.28**	**0.41**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.06**	**0.07**	**0.07**	**0.10**	**0.12**	**0.14**	**0.14**	**0.15**	**0.12**	**0.08**	**0.06**	**0.05**	**0.15**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.03**	**0.03**	**0.03**	**0.05**	**0.06**	**0.06**	**0.06**	**0.07**	**0.05**	**0.04**	**0.03**	**0.03**	**0.07**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.29**	**0.31**	**0.31**	**0.35**	**0.38**	**0.40**	**0.40**	**0.41**	**0.37**	**0.32**	**0.29**	**0.28**	**0.41**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.29	0.31	0.31	0.35	0.38	0.40	0.40	0.41	0.37	0.32	0.29	0.28	0.41	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Biphenyl Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25	2.2	2.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	20
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.14	0.13	0.14	28
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-869 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	134.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	115.39
Maximum Pumping Rate (bbl/hr):	3,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Jet Naphtha**	**January**	**52.61**	--	--	**52.35**	**1.0797**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0146	--	--	78.11	78.11	1.00%	1.32%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0175	--	--	84.16	84.16	1.24%	1.70%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0328	--	--	86.18	86.18	1.50%	3.28%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0109	--	--	92.14	92.14	3.20%	1.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0025	--	--	106.17	106.17	3.20%	0.31%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**February**	**50.11**	--	--	**49.76**	**1.0216**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0136	--	--	78.11	78.11	1.00%	1.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0163	--	--	84.16	84.16	1.24%	1.68%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0307	--	--	86.18	86.18	1.50%	3.24%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0101	--	--	92.14	92.14	3.20%	1.14%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0023	--	--	106.17	106.17	3.20%	0.30%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**March**	**56.68**	--	--	**56.14**	**1.1801**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0164	--	--	78.11	78.11	1.00%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0196	--	--	84.16	84.16	1.24%	1.74%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0366	--	--	86.18	86.18	1.50%	3.34%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0124	--	--	92.14	92.14	3.20%	1.21%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0029	--	--	106.17	106.17	3.20%	0.33%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**April**	**65.40**	--	--	**64.61**	**1.4217**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0209	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0248	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0459	--	--	86.18	86.18	1.50%	3.48%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0163	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**May**	**65.13**	--	--	**64.27**	**1.4135**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0207	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0246	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0456	--	--	86.18	86.18	1.50%	3.47%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0161	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**June**	**74.40**	--	--	**73.31**	**1.7115**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-869 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Benzene						0.0265	--	--	78.11	78.11	1.00%	1.51%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0312	--	--	84.16	84.16	1.24%	1.92%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0574	--	--	86.18	86.18	1.50%	3.61%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0213	--	--	92.14	92.14	3.20%	1.43%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0053	--	--	106.17	106.17	3.20%	0.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**July**	**75.76**	--	--	**74.69**	**1.7594**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0274	--	--	78.11	78.11	1.00%	1.52%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0323	--	--	84.16	84.16	1.24%	1.93%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	0.50%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0594	--	--	86.18	86.18	1.50%	3.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0221	--	--	92.14	92.14	3.20%	1.45%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0056	--	--	106.17	106.17	3.20%	0.42%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**August**	**77.99**	--	--	**77.05**	**1.8400**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0290	--	--	78.11	78.11	1.00%	1.54%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0342	--	--	84.16	84.16	1.24%	1.96%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	0.50%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0626	--	--	86.18	86.18	1.50%	3.67%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0236	--	--	92.14	92.14	3.20%	1.48%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0060	--	--	106.17	106.17	3.20%	0.43%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**September**	**72.72**	--	--	**71.98**	**1.6542**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0253	--	--	78.11	78.11	1.00%	1.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0299	--	--	84.16	84.16	1.24%	1.90%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0009	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0551	--	--	86.18	86.18	1.50%	3.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0203	--	--	92.14	92.14	3.20%	1.41%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0050	--	--	106.17	106.17	3.20%	0.40%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**October**	**65.22**	--	--	**64.66**	**1.4163**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0208	--	--	78.11	78.11	1.00%	1.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0246	--	--	84.16	84.16	1.24%	1.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0457	--	--	86.18	86.18	1.50%	3.48%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0162	--	--	92.14	92.14	3.20%	1.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0039	--	--	106.17	106.17	3.20%	0.37%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**November**	**57.31**	--	--	**56.97**	**1.1964**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0167	--	--	78.11	78.11	1.00%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0199	--	--	84.16	84.16	1.24%	1.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0372	--	--	86.18	86.18	1.50%	3.35%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0127	--	--	92.14	92.14	3.20%	1.22%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0030	--	--	106.17	106.17	3.20%	0.33%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Jet Naphtha**	**December**	**51.82**	--	--	**51.63**	**1.0612**	--	--	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.36 and B = 5784.3.**
	Benzene						0.0143	--	--	78.11	78.11	1.00%	1.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Biphenyl						0.0000	--	--	154.21	154.21	0.12%	0.00%	Equation 1-26 (Antoine's equation). A = 7.24, B = 1998.7, C = 202.73.
	Cyclohexane						0.0171	--	--	84.16	84.16	1.24%	1.69%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.05%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0322	--	--	86.18	86.18	1.50%	3.26%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Naphthalene						0.0000	--	--	128.17	128.17	0.47%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0106	--	--	92.14	92.14	3.20%	1.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0024	--	--	106.17	106.17	3.20%	0.30%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-869 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**44.42**	**48.23**	**53.52**	**73.76**	**92.10**	**98.35**	**103.96**	**108.45**	**84.99**	**59.81**	**44.25**	**40.84**	**852.69**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0190	0.0180	0.0209	0.0254	0.0252	0.0309	0.0318	0.0333	0.0298	0.0253	0.0212	0.0187		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	1.0797	1.0216	1.1801	1.4217	1.4135	1.7115	1.7594	1.8400	1.6542	1.4163	1.1964	1.0612		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**20.55**	**21.54**	**24.27**	**32.94**	**41.73**	**44.01**	**46.50**	**48.49**	**37.98**	**27.57**	**20.93**	**19.24**	**385.75**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0190	0.0180	0.0209	0.0254	0.0252	0.0309	0.0318	0.0333	0.0298	0.0253	0.0212	0.0187		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	158.93	195.38	171.12	197.48	243.55	216.83	215.30	214.03	194.00	160.61	150.31	151.54		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**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**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**57.38**	**51.83**	**57.38**	**55.53**	**57.38**	**55.53**	**57.38**	**57.38**	**55.53**	**57.38**	**55.53**	**57.38**	**675.58**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	849,315	767,123	849,315	821,918	849,315	821,918	849,315	849,315	821,918	849,315	821,918	849,315		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40		From Chemical Properties Database
D	Tank Diameter (ft)	134	134	134	134	134	134	134	134	134	134	134	134		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**122.35**	**121.60**	**135.17**	**162.23**	**191.21**	**197.88**	**207.84**	**214.32**	**178.49**	**144.76**	**120.71**	**117.46**	**1,914.02**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	122.35	121.60	135.17	162.23	191.21	197.88	207.84	214.32	178.49	144.76	120.71	117.46	1,914.02	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	9.71	9.38	10.63	12.66	14.64	15.57	16.42	17.02	14.12	11.55	9.67	9.39	150.76	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	1.43	1.42	1.63	2.08	2.49	2.70	2.86	2.99	2.39	1.82	1.44	1.36	24.64	Calculated using Equations 40-1 through 40-9
L_{Ti}	Biphenyl Losses (lb/month)	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.81	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	1.82	1.81	2.07	2.64	3.16	3.42	3.62	3.78	3.03	2.31	1.83	1.73	31.23	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.32	0.30	0.33	0.35	0.37	0.38	0.40	0.41	0.37	0.34	0.32	0.32	4.21	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	2.99	3.04	3.46	4.54	5.51	5.98	6.33	6.62	5.25	3.90	3.02	2.82	53.44	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.27	0.24	0.27	0.26	0.27	0.26	0.27	0.27	0.26	0.27	0.26	0.27	3.18	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	2.59	2.45	2.78	3.18	3.60	3.81	4.02	4.15	3.51	2.99	2.57	2.53	38.19	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	2.04	1.87	2.09	2.17	2.33	2.37	2.47	2.51	2.27	2.16	1.99	2.02	26.28	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-869 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.29**	**0.31**	**0.31**	**0.35**	**0.38**	**0.40**	**0.40**	**0.41**	**0.37**	**0.32**	**0.29**	**0.28**	**0.41**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.06**	**0.07**	**0.07**	**0.10**	**0.12**	**0.14**	**0.14**	**0.15**	**0.12**	**0.08**	**0.06**	**0.05**	**0.15**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.03**	**0.03**	**0.03**	**0.05**	**0.06**	**0.06**	**0.06**	**0.07**	**0.05**	**0.04**	**0.03**	**0.03**	**0.07**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.29**	**0.31**	**0.31**	**0.35**	**0.38**	**0.40**	**0.40**	**0.41**	**0.37**	**0.32**	**0.29**	**0.28**	**0.41**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.29	0.31	0.31	0.35	0.38	0.40	0.40	0.41	0.37	0.32	0.29	0.28	0.41	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Biphenyl Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25	2.2	2.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	20
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.14	0.13	0.14	28
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-876 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	118.00	Tank Volume (bbl):	76,750.00
Net Throughput (bbl/yr):	25,000,000	Turnovers Per Year:	315.33
Maximum Pumping Rate (bbl/hr):	7,000.000		
Shell Height (ft):	42	Maximum Liquid Height (ft):	41.7
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Hot Stock	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	4.88
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Heavy Reformate**	**January**	**84.66**	**81.48**	**87.84**	**101.80**	**3.1274**	**2.9340**	**3.3310**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0118	0.0105	0.0132	120.19	120.19	20.26%	0.46%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0074	0.0068	0.0081	114.23	114.23	0.54%	0.27%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0180	0.0163	0.0198	106.17	106.17	6.06%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0245	0.0220	0.0272	120.19	120.19	19.07%	0.95%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0189	0.0173	0.0206	92.14	92.14	1.89%	0.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0213	0.0192	0.0235	106.17	106.17	8.17%	0.73%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0142	0.0129	0.0158	106.17	106.17	6.82%	0.49%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0332	0.0300	0.0366	106.17	106.17	11.95%	1.14%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**February**	**83.12**	**79.86**	**86.38**	**100.70**	**3.0324**	**2.8392**	**3.2362**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0112	0.0099	0.0125	120.19	120.19	20.26%	0.45%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0071	0.0066	0.0078	114.23	114.23	0.54%	0.27%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0172	0.0155	0.0190	106.17	106.17	6.06%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0233	0.0209	0.0260	120.19	120.19	19.07%	0.93%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0181	0.0165	0.0198	92.14	92.14	1.89%	0.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0203	0.0183	0.0224	106.17	106.17	8.17%	0.72%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0136	0.0122	0.0150	106.17	106.17	6.82%	0.48%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0316	0.0285	0.0350	106.17	106.17	11.95%	1.12%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**March**	**90.44**	**86.16**	**94.72**	**108.30**	**3.5055**	**3.2221**	**3.8090**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0145	0.0124	0.0167	120.19	120.19	20.26%	0.50%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0086	0.0077	0.0096	114.23	114.23	0.54%	0.28%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0215	0.0188	0.0244	106.17	106.17	6.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0296	0.0258	0.0340	120.19	120.19	19.07%	1.03%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0221	0.0197	0.0248	92.14	92.14	1.89%	0.59%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0254	0.0223	0.0290	106.17	106.17	8.17%	0.78%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0171	0.0149	0.0195	106.17	106.17	6.82%	0.52%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0396	0.0347	0.0449	106.17	106.17	11.95%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**April**	**96.87**	**91.50**	**102.24**	**113.30**	**3.9691**	**3.5791**	**4.3929**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0180	0.0150	0.0215	120.19	120.19	20.26%	0.55%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0101	0.0088	0.0115	114.23	114.23	0.54%	0.29%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0260	0.0222	0.0304	106.17	106.17	6.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-876 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Isopropyl benzene						0.0364	0.0307	0.0430	120.19	120.19	19.07%	1.11%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0263	0.0228	0.0302	92.14	92.14	1.89%	0.62%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0309	0.0263	0.0361	106.17	106.17	8.17%	0.83%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0208	0.0177	0.0244	106.17	106.17	6.82%	0.56%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0479	0.0408	0.0559	106.17	106.17	11.95%	1.29%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**May**	**95.57**	**90.59**	**100.55**	**111.40**	**3.8716**	**3.5157**	**4.2562**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0172	0.0145	0.0204	120.19	120.19	20.26%	0.54%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0098	0.0086	0.0110	114.23	114.23	0.54%	0.29%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0250	0.0216	0.0290	106.17	106.17	6.06%	0.69%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0349	0.0298	0.0408	120.19	120.19	19.07%	1.10%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0254	0.0222	0.0289	92.14	92.14	1.89%	0.61%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0297	0.0256	0.0344	106.17	106.17	8.17%	0.82%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0200	0.0172	0.0232	106.17	106.17	6.82%	0.55%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0461	0.0397	0.0533	106.17	106.17	11.95%	1.28%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**June**	**92.44**	**85.68**	**99.20**	**101.40**	**3.6447**	**3.1913**	**4.1493**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0155	0.0122	0.0195	120.19	120.19	20.26%	0.52%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0090	0.0076	0.0107	114.23	114.23	0.54%	0.29%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0228	0.0186	0.0279	106.17	106.17	6.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0316	0.0254	0.0392	120.19	120.19	19.07%	1.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0234	0.0194	0.0279	92.14	92.14	1.89%	0.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0270	0.0220	0.0331	106.17	106.17	8.17%	0.80%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0182	0.0147	0.0223	106.17	106.17	6.82%	0.53%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0420	0.0342	0.0512	106.17	106.17	11.95%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**July**	**97.72**	**90.87**	**104.57**	**108.80**	**4.0340**	**3.5352**	**4.5884**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0185	0.0147	0.0232	120.19	120.19	20.26%	0.56%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0103	0.0087	0.0121	114.23	114.23	0.54%	0.29%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0267	0.0218	0.0325	106.17	106.17	6.06%	0.71%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0374	0.0301	0.0462	120.19	120.19	19.07%	1.13%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0269	0.0224	0.0321	92.14	92.14	1.89%	0.62%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0317	0.0258	0.0386	106.17	106.17	8.17%	0.84%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0214	0.0173	0.0262	106.17	106.17	6.82%	0.57%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0491	0.0401	0.0598	106.17	106.17	11.95%	1.30%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**August**	**106.10**	**99.51**	**112.69**	**120.60**	**4.7204**	**4.1735**	**5.3238**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0244	0.0197	0.0301	120.19	120.19	20.26%	0.63%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0126	0.0108	0.0146	114.23	114.23	0.54%	0.31%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0002	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0339	0.0281	0.0407	106.17	106.17	6.06%	0.77%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0484	0.0395	0.0589	120.19	120.19	19.07%	1.24%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0333	0.0282	0.0393	92.14	92.14	1.89%	0.66%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0404	0.0334	0.0486	106.17	106.17	8.17%	0.92%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0274	0.0225	0.0330	106.17	106.17	6.82%	0.62%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0624	0.0517	0.0749	106.17	106.17	11.95%	1.42%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**September**	**94.87**	**88.79**	**100.95**	**106.30**	**3.8199**	**3.3937**	**4.2886**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0168	0.0136	0.0206	120.19	120.19	20.26%	0.53%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0096	0.0083	0.0111	114.23	114.23	0.54%	0.29%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0245	0.0204	0.0293	106.17	106.17	6.06%	0.69%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0342	0.0281	0.0413	120.19	120.19	19.07%	1.09%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0249	0.0212	0.0292	92.14	92.14	1.89%	0.61%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0291	0.0242	0.0348	106.17	106.17	8.17%	0.82%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0196	0.0162	0.0235	106.17	106.17	6.82%	0.55%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0451	0.0376	0.0539	106.17	106.17	11.95%	1.27%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**October**	**91.12**	**84.77**	**97.47**	**104.70**	**3.5524**	**3.1343**	**4.0147**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0148	0.0118	0.0184	120.19	120.19	20.26%	0.51%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0088	0.0074	0.0102	114.23	114.23	0.54%	0.28%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0219	0.0181	0.0265	106.17	106.17	6.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0303	0.0246	0.0371	120.19	120.19	19.07%	1.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0225	0.0189	0.0267	92.14	92.14	1.89%	0.59%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0260	0.0213	0.0314	106.17	106.17	8.17%	0.78%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0175	0.0143	0.0212	106.17	106.17	6.82%	0.53%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-876 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (p)						0.0404	0.0333	0.0487	106.17	106.17	11.95%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**November**	**89.33**	**84.57**	**94.09**	**106.40**	**3.4302**	**3.1217**	**3.7630**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0139	0.0118	0.0164	120.19	120.19	20.26%	0.49%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0084	0.0074	0.0094	114.23	114.23	0.54%	0.28%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0208	0.0179	0.0240	106.17	106.17	6.06%	0.65%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0286	0.0244	0.0333	120.19	120.19	19.07%	1.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0215	0.0188	0.0244	92.14	92.14	1.89%	0.58%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0246	0.0212	0.0284	106.17	106.17	8.17%	0.77%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0165	0.0142	0.0191	106.17	106.17	6.82%	0.52%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0383	0.0331	0.0441	106.17	106.17	11.95%	1.20%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Heavy Reformate**	**December**	**82.60**	**79.97**	**85.23**	**99.10**	**3.0009**	**2.8457**	**3.1630**	**135.00**	**99.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 4 psia, and a distillation slope of 3 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0110	0.0100	0.0120	120.19	120.19	20.26%	0.44%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Isooctane						0.0070	0.0066	0.0075	114.23	114.23	0.54%	0.27%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0001	0.0001	0.0001	78.11	78.11	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0001	0.0001	0.0001	84.16	84.16	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0169	0.0155	0.0183	106.17	106.17	6.06%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0229	0.0209	0.0250	120.19	120.19	19.07%	0.93%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.09%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0178	0.0166	0.0192	92.14	92.14	1.89%	0.55%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0199	0.0183	0.0217	106.17	106.17	8.17%	0.71%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0133	0.0122	0.0145	106.17	106.17	6.82%	0.48%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0311	0.0286	0.0337	106.17	106.17	11.95%	1.11%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-876 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**5,047.52**	**4,575.48**	**7,415.82**	**9,910.14**	**9,305.11**	**11,504.59**	**13,126.00**	**14,606.36**	**10,791.37**	**11,027.40**	**7,836.92**	**4,045.02**	**109,191.72**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0547	0.0533	0.0608	0.0678	0.0662	0.0619	0.0681	0.0790	0.0649	0.0610	0.0595	0.0527		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0576	0.0580	0.0834	0.1142	0.1041	0.1354	0.1476	0.1615	0.1259	0.1249	0.0914	0.0464		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.2169	0.2222	0.1982	0.1792	0.1829	0.1921	0.1768	0.1551	0.1849	0.1961	0.2017	0.2240		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09	238,147.09		Calculated Using Equation 1-3
D	Tank Diameter (ft)	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	21.777	21.777	21.777	21.777	21.777	21.777	21.777	21.777	21.777	21.777	21.777	21.777		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	21.85	21.85	21.85	21.85	21.85	21.85	21.85	21.85	21.85	21.85	21.85	21.85		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**	**1.63**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88	4.88		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0547**	**0.0533**	**0.0608**	**0.0678**	**0.0662**	**0.0619**	**0.0681**	**0.0790**	**0.0649**	**0.0610**	**0.0595**	**0.0527**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.1274	3.0324	3.5055	3.9691	3.8716	3.6447	4.0340	4.7204	3.8199	3.5524	3.4302	3.0009		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	544.33	542.79	550.11	556.54	555.24	552.11	557.39	565.77	554.54	550.79	549.00	542.27		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	527.19	525.20	532.25	540.12	539.42	543.16	546.30	551.26	543.12	537.20	531.94	525.78		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0576**	**0.0580**	**0.0834**	**0.1142**	**0.1041**	**0.1354**	**0.1476**	**0.1615**	**0.1259**	**0.1249**	**0.0914**	**0.0464**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.72	13.04	17.13	21.46	19.93	27.06	27.39	26.35	24.34	25.40	19.04	10.51		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.40	0.40	0.59	0.81	0.74	0.96	1.05	1.15	0.89	0.88	0.64	0.32		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.1274	3.0324	3.5055	3.9691	3.8716	3.6447	4.0340	4.7204	3.8199	3.5524	3.4302	3.0009		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	2.9340	2.8392	3.2221	3.5791	3.5157	3.1913	3.5352	4.1735	3.3937	3.1343	3.1217	2.8457		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	3.3310	3.2362	3.8090	4.3929	4.2562	4.1493	4.5884	5.3238	4.2886	4.0147	3.7630	3.1630		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	544.33	542.79	550.11	556.54	555.24	552.11	557.39	565.77	554.54	550.79	549.00	542.27		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	541.15	539.53	545.83	551.17	550.26	545.35	550.54	559.18	548.46	544.44	544.24	539.64		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	547.51	546.05	554.39	561.91	560.22	558.87	564.24	572.36	560.62	557.14	553.76	544.90		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.2169**	**0.2222**	**0.1982**	**0.1792**	**0.1829**	**0.1921**	**0.1768**	**0.1551**	**0.1849**	**0.1961**	**0.2017**	**0.2240**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.1274	3.0324	3.5055	3.9691	3.8716	3.6447	4.0340	4.7204	3.8199	3.5524	3.4302	3.0009		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767	21.7767		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**170,790.39**	**150,146.89**	**189,624.61**	**204,748.17**	**206,642.59**	**186,962.19**	**212,594.17**	**246,532.34**	**195,961.36**	**190,384.98**	**179,666.63**	**164,326.38**	**2,298,380.70**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	3.1274	3.0324	3.5055	3.9691	3.8716	3.6447	4.0340	4.7204	3.8199	3.5524	3.4302	3.0009		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	89,178,082	80,547,945	89,178,082	86,301,370	89,178,082	86,301,370	89,178,082	89,178,082	86,301,370	89,178,082	86,301,370	89,178,082		Specified monthly throughput
N	Annual Turnovers	315.33	315.33	315.33	315.33	315.33	315.33	315.33	315.33	315.33	315.33	315.33	315.33		Calculated Using Equation 1-36
K_N	Turnover Factor	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618	0.2618		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	41.70	41.70	41.70	41.70	41.70	41.70	41.70	41.70	41.70	41.70	41.70	41.70		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00	118.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_N	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**175,837.91**	**154,722.37**	**197,040.43**	**214,658.31**	**215,947.70**	**198,466.78**	**225,720.17**	**261,138.70**	**206,752.73**	**201,412.39**	**187,503.54**	**168,371.39**	**2,407,572.43**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	175,837.91	154,722.37	197,040.43	214,658.31	215,947.70	198,466.78	225,720.17	261,138.70	206,752.73	201,412.39	187,503.54	168,371.39	2,407,572.43	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	8,372.90	7,243.71	9,984.99	11,629.83	11,544.90	10,271.30	12,335.46	15,508.38	10,973.88	10,280.16	9,390.33	7,837.51	125,373.37	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	2.91	2.54	3.35	3.76	3.76	3.41	3.97	4.76	3.59	3.44	3.18	2.76	41.44	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	4.25	3.71	4.87	5.45	5.45	4.95	5.75	6.86	5.21	5.00	4.62	4.03	60.14	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1,085.10	938.57	1,294.87	1,508.96	1,497.80	1,332.24	1,600.60	2,013.04	1,423.65	1,333.23	1,217.61	1,015.43	16,261.10	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/month)	481.86	420.21	557.95	629.44	628.84	568.22	664.86	802.96	599.81	572.48	527.67	455.89	6,910.17	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	1,673.21	1,442.18	2,022.58	2,389.82	2,365.64	2,090.05	2,539.50	3,249.16	2,245.16	2,085.61	1,897.28	1,558.42	25,558.62	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.48	0.41	0.61	0.75	0.73	0.63	0.80	1.08	0.69	0.63	0.56	0.44	7.81	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	988.35	859.21	1,157.76	1,322.65	1,318.07	1,183.74	1,399.37	1,717.11	1,255.50	1,189.52	1,092.52	931.17	14,414.97	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	805.38	691.74	986.30	1,181.93	1,166.67	1,023.72	1,258.26	1,638.72	1,105.57	1,018.57	922.91	746.61	12,546.38	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	1,282.86	1,109.13	1,533.42	1,790.30	1,776.39	1,578.60	1,899.49	2,394.77	1,688.10	1,579.17	1,441.48	1,199.78	19,273.50	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	858.59	741.59	1,030.00	1,207.22	1,196.92	1,061.64	1,281.50	1,623.45	1,136.95	1,061.17	967.58	801.93	12,968.53	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	1,999.54	1,729.87	2,384.45	2,776.95	2,756.74	2,452.76	2,945.38	3,702.07	2,620.43	2,454.92	2,242.47	1,871.67	29,937.21	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-876 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**2,083.19**	**2,025.69**	**2,310.56**	**2,585.89**	**2,528.25**	**2,393.61**	**2,624.13**	**3,025.19**	**2,497.64**	**2,338.54**	**2,265.45**	**2,006.56**	**3,025.19**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	3.13	3.03	3.51	3.97	3.87	3.64	4.03	4.72	3.82	3.55	3.43	3.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	294,000	294,000	294,000	294,000	294,000	294,000	294,000	294,000	294,000	294,000	294,000	294,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**2,083.19**	**2,025.69**	**2,310.56**	**2,585.89**	**2,528.25**	**2,393.61**	**2,624.13**	**3,025.19**	**2,497.64**	**2,338.54**	**2,265.45**	**2,006.56**	**3,025.19**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	2,083.19	2,025.69	2,310.56	2,585.89	2,528.25	2,393.61	2,624.13	3,025.19	2,497.64	2,338.54	2,265.45	2,006.56	3,025.19	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	99.20	94.84	117.09	140.10	135.16	123.88	143.41	179.66	132.57	119.36	113.46	93.40	179.66	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.03	0.03	0.04	0.05	0.04	0.04	0.05	0.06	0.04	0.04	0.04	0.03	0.06	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.05	0.05	0.06	0.07	0.06	0.06	0.07	0.08	0.06	0.06	0.06	0.05	0.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	12.86	12.29	15.18	18.18	17.54	16.07	18.61	23.32	17.20	15.48	14.71	12.10	23.32	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/hr)	5.71	5.50	6.54	7.58	7.36	6.85	7.73	9.30	7.25	6.65	6.38	5.43	9.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	19.82	18.88	23.72	28.79	27.70	25.21	29.52	37.64	27.12	24.22	22.92	18.57	37.64	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	11.71	11.25	13.58	15.93	15.43	14.28	16.27	19.89	15.17	13.81	13.20	11.10	19.89	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	9.54	9.06	11.57	14.24	13.66	12.35	14.63	18.98	13.36	11.83	11.15	8.90	18.98	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	15.20	14.52	17.98	21.57	20.80	19.04	22.08	27.74	20.39	18.34	17.42	14.30	27.74	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	10.17	9.71	12.08	14.54	14.01	12.80	14.90	18.81	13.73	12.32	11.69	9.56	18.81	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	23.69	22.65	27.96	33.45	32.28	29.58	34.24	42.89	31.66	28.50	27.09	22.31	42.89	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-877 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	70.00	Tank Volume (bbl):	24,676.00
Net Throughput (bbl/yr):	79,735	Turnovers Per Year:	3.50
Maximum Pumping Rate (bbl/hr):	1,000.000		
Shell Height (ft):	36	Maximum Liquid Height (ft):	34.2
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	2.19
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.02	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L}	Z_{V}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Spent Caustic**	**January**	**52.17**	**48.88**	**55.46**	**51.78**	**0.1915**	**0.1695**	**0.2160**	**18.00**	**18.53**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1899	0.1680	0.2142	18.0153	18.0153	99.00%	96.38%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0016	0.0015	0.0017	120	80	1.00%	3.62%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**February**	**49.52**	**46.17**	**52.87**	**49.00**	**0.1736**	**0.1530**	**0.1965**	**18.00**	**18.56**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1721	0.1516	0.1949	18.0153	18.0153	99.00%	96.24%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0015	0.0014	0.0016	120	80	1.00%	3.76%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**March**	**55.77**	**51.38**	**60.16**	**54.98**	**0.2185**	**0.1860**	**0.2558**	**18.00**	**18.51**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2167	0.1844	0.2539	18.0153	18.0153	99.00%	96.57%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0017	0.0016	0.0019	120	80	1.00%	3.43%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**April**	**64.05**	**58.57**	**69.53**	**62.87**	**0.2934**	**0.2417**	**0.3545**	**18.00**	**18.45**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2913	0.2398	0.3522	18.0153	18.0153	99.00%	96.94%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0023	120	80	1.00%	3.06%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**May**	**63.67**	**58.61**	**68.73**	**62.40**	**0.2895**	**0.2420**	**0.3450**	**18.00**	**18.46**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2875	0.2401	0.3427	18.0153	18.0153	99.00%	96.92%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0023	120	80	1.00%	3.08%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**June**	**72.55**	**65.66**	**79.44**	**70.94**	**0.3928**	**0.3103**	**0.4938**	**18.00**	**18.41**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.3904	0.3082	0.4910	18.0153	18.0153	99.00%	97.26%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0025	0.0021	0.0028	120	80	1.00%	2.74%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**July**	**73.95**	**66.97**	**80.93**	**72.37**	**0.4118**	**0.3247**	**0.5185**	**18.00**	**18.40**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.4092	0.3225	0.5155	18.0153	18.0153	99.00%	97.31%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0025	0.0022	0.0029	120	80	1.00%	2.69%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**August**	**76.40**	**69.67**	**83.13**	**75.01**	**0.4468**	**0.3563**	**0.5567**	**18.00**	**18.39**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.4441	0.3539	0.5537	18.0153	18.0153	99.00%	97.40%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0027	0.0023	0.0031	120	80	1.00%	2.60%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**September**	**71.46**	**65.22**	**77.70**	**70.36**	**0.3786**	**0.3056**	**0.4664**	**18.00**	**18.41**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.3762	0.3035	0.4637	18.0153	18.0153	99.00%	97.23%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0024	0.0021	0.0027	120	80	1.00%	2.77%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**October**	**64.26**	**57.71**	**70.81**	**63.43**	**0.2956**	**0.2343**	**0.3704**	**18.00**	**18.45**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2935	0.2325	0.3680	18.0153	18.0153	99.00%	96.95%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0024	120	80	1.00%	3.05%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**November**	**56.73**	**51.80**	**61.66**	**56.23**	**0.2262**	**0.1889**	**0.2697**	**18.00**	**18.50**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2244	0.1873	0.2678	18.0153	18.0153	99.00%	96.61%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0018	0.0016	0.0020	120	80	1.00%	3.39%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**December**	**51.49**	**48.77**	**54.21**	**51.20**	**0.1868**	**0.1688**	**0.2064**	**18.00**	**18.54**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1852	0.1673	0.2047	18.0153	18.0153	99.00%	96.35%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0016	0.0015	0.0017	120	80	1.00%	3.65%	Equation 1-25. A = 11.36 and B = 5784.3.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-877 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**32.07**	**27.32**	**49.34**	**77.07**	**72.38**	**124.04**	**134.88**	**138.36**	**108.58**	**97.11**	**55.78**	**25.27**	**942.19**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0010	0.0009	0.0013	0.0013	0.0014	0.0012	0.0010	0.0008	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0254	0.0259	0.0354	0.0462	0.0424	0.0611	0.0624	0.0608	0.0547	0.0560	0.0403	0.0204		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8339	0.8470	0.8148	0.7661	0.7685	0.7099	0.7001	0.6827	0.7174	0.7648	0.8095	0.8373		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53		Calculated Using Equation 1-3
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73		Calculated Using Equation 1-17 or 1-19
H_{RD}	**Roof Outage - Cone Roof (ft)**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0010**	**0.0009**	**0.0013**	**0.0013**	**0.0014**	**0.0012**	**0.0010**	**0.0008**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.44	523.72	523.34	532.22	533.62	536.07	531.13	523.93	516.40	511.16		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.22	509.71	516.23	524.90	524.61	533.83	535.20	537.46	532.23	524.77	516.90	511.45		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0254**	**0.0259**	**0.0354**	**0.0462**	**0.0424**	**0.0611**	**0.0624**	**0.0608**	**0.0547**	**0.0560**	**0.0403**	**0.0204**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.14	13.41	17.56	21.90	20.25	27.56	27.92	26.92	24.96	26.21	19.72	10.88		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.04	0.07	0.11	0.10	0.18	0.19	0.20	0.16	0.14	0.08	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1695	0.1530	0.1860	0.2417	0.2420	0.3103	0.3247	0.3563	0.3056	0.2343	0.1889	0.1688		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2160	0.1965	0.2558	0.3545	0.3450	0.4938	0.5185	0.5567	0.4664	0.3704	0.2697	0.2064		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.44	523.72	523.34	532.22	533.62	536.07	531.13	523.93	516.40	511.16		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.55	505.84	511.05	518.24	518.28	525.33	526.64	529.34	524.89	517.38	511.47	508.44		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.13	512.54	519.83	529.20	528.40	539.11	540.60	542.80	537.37	530.48	521.33	513.88		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8339**	**0.8470**	**0.8148**	**0.7661**	**0.7685**	**0.7099**	**0.7001**	**0.6827**	**0.7174**	**0.7648**	**0.8095**	**0.8373**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**24.55**	**20.22**	**27.75**	**35.36**	**36.08**	**46.44**	**50.15**	**54.15**	**44.91**	**36.82**	**27.76**	**23.98**	**428.16**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	284,424	256,899	284,424	275,249	284,424	275,249	284,424	284,424	275,249	284,424	275,249	284,424		Specified monthly throughput
N	Annual Turnovers	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**56.62**	**47.54**	**77.08**	**112.43**	**108.46**	**170.48**	**185.02**	**192.51**	**153.48**	**133.93**	**83.54**	**49.26**	**1,370.35**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2.05	1.79	2.65	3.44	3.34	4.66	4.97	5.01	4.26	4.09	2.83	1.80	40.89	Sum of VOC Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	54.58	45.75	74.44	108.99	105.12	165.82	180.05	187.50	149.23	129.84	80.71	47.46	1,329.47	Sum of Non-Pollutant Component Emissions
L_{TJ}	Jet Naphtha Losses (lb/month)	2.05	1.79	2.65	3.44	3.34	4.66	4.97	5.01	4.26	4.09	2.83	1.80	40.89	Calculated using Equations 40-1 through 40-9
L_{TJ}	Water Losses (lb/month)	54.58	45.75	74.44	108.99	105.12	165.82	180.05	187.50	149.23	129.84	80.71	47.46	1,329.47	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-877 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.63**	**3.31**	**4.10**	**5.41**	**5.34**	**7.11**	**7.43**	**8.02**	**6.87**	**5.45**	**4.24**	**3.54**	**8.02**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.19	0.17	0.22	0.29	0.29	0.39	0.41	0.45	0.38	0.30	0.23	0.19		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.63**	**3.31**	**4.10**	**5.41**	**5.34**	**7.11**	**7.43**	**8.02**	**6.87**	**5.45**	**4.24**	**3.54**	**8.02**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.13	0.12	0.14	0.17	0.16	0.19	0.20	0.21	0.19	0.17	0.14	0.13	0.21	Sum of VOC Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	3.50	3.19	3.96	5.24	5.18	6.91	7.23	7.81	6.68	5.28	4.10	3.41	7.81	Sum of Non-Pollutant Component Emissions
L_{TI}	Jet Naphtha Losses (lb/hr)	0.13	0.12	0.14	0.17	0.16	0.19	0.20	0.21	0.19	0.17	0.14	0.13	0.21	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	3.50	3.19	3.96	5.24	5.18	6.91	7.23	7.81	6.68	5.28	4.10	3.41	7.81	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-895 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	70,167.00
Net Throughput (bbl/yr):	1,094,605	Turnovers Per Year:	12.41
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	47.8	Maximum Liquid Height (ft):	44.8
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{V_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 6 Fuel Oil**	**January**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**February**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**March**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**April**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**May**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-895 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**June**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**July**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**August**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**September**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**October**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**November**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 6 Fuel Oil**	**December**	**160.00**	**160.00**	**160.00**	**160.00**	**0.0264**	**0.0264**	**0.0264**	**387.00**	**190.00**	--	--	**Equation 1-25. A = 10.78 and B = 8933.**
	Trimethylbenzene (1,2,4)						0.0016	0.0016	0.0016	120.19	120.19	0.10%	3.91%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0011	0.0011	78.11	78.11	0.00%	1.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0005	0.0005	0.0005	84.16	84.16	0.00%	0.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0006	0.0006	0.0006	106.17	106.17	0.01%	1.19%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0014	0.0014	86.18	86.18	0.00%	2.44%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.00%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0003	0.0003	0.0003	128.17	128.17	0.10%	0.70%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0017	0.0017	0.0017	92.14	92.14	0.01%	3.17%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0029	0.0029	0.0029	106.17	106.17	0.05%	6.17%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-895 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641	0.9641		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0008**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia\text{-}ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67		Fully insulated tanks assumed equal to T_{LA}
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**	**0.9641**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**393.55**	**355.47**	**393.55**	**380.86**	**393.55**	**380.86**	**393.55**	**393.55**	**380.86**	**393.55**	**380.86**	**393.55**	**4,633.79**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264	0.0264		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	3,904,592	3,526,729	3,904,592	3,778,638	3,904,592	3,778,638	3,904,592	3,904,592	3,778,638	3,904,592	3,778,638	3,904,592		Specified monthly throughput
N	Annual Turnovers	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**393.55**	**355.47**	**393.55**	**380.86**	**393.55**	**380.86**	**393.55**	**393.55**	**380.86**	**393.55**	**380.86**	**393.55**	**4,633.79**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	393.55	355.47	393.55	380.86	393.55	380.86	393.55	393.55	380.86	393.55	380.86	393.55	4,633.79	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	61.12	55.20	61.12	59.15	61.12	59.15	61.12	61.12	59.15	61.12	59.15	61.12	719.63	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	6.72	6.07	6.72	6.50	6.72	6.50	6.72	6.72	6.50	6.72	6.50	6.72	79.10	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	3.31	2.99	3.31	3.20	3.31	3.20	3.31	3.31	3.20	3.31	3.20	3.31	38.98	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.16	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	9.62	8.69	9.62	9.31	9.62	9.31	9.62	9.62	9.31	9.62	9.31	9.62	113.27	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.59	0.53	0.59	0.57	0.59	0.57	0.59	0.59	0.57	0.59	0.57	0.59	6.90	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	2.76	2.49	2.76	2.67	2.76	2.67	2.76	2.76	2.67	2.76	2.67	2.76	32.52	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	12.48	11.27	12.48	12.08	12.48	12.08	12.48	12.48	12.08	12.48	12.08	12.48	146.94	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	15.39	13.90	15.39	14.90	15.39	14.90	15.39	15.39	14.90	15.39	14.90	15.39	181.25	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	24.27	21.92	24.27	23.49	24.27	23.49	24.27	24.27	23.49	24.27	23.49	24.27	285.73	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-895 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67	619.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	**25.40**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	25.40	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-905 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	130.00	Tank Volume (bbl):	100,000.00
Net Throughput (bbl/yr):	6,282,419	Turnovers Per Year:	57.77
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	47
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.83
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.19**	**49.00**	**55.38**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0002	0.0003	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.55**	**46.28**	**52.82**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.0002	0.0003	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.82%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.83**	**51.54**	**60.12**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.73%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**64.13**	**58.75**	**69.51**	**62.87**	**0.0064**	**0.0053**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-905 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.76**	**58.77**	**68.75**	**62.40**	**0.0063**	**0.0053**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.66**	**65.88**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0005	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**74.06**	**67.20**	**80.92**	**72.37**	**0.0091**	**0.0072**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.49**	**69.89**	**83.09**	**75.01**	**0.0100**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.16%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.41%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.54**	**65.44**	**77.64**	**70.36**	**0.0084**	**0.0067**	**0.0104**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0004	0.0005	78.11	78.11	0.01%	3.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.32**	**57.95**	**70.69**	**63.43**	**0.0064**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.43%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.77**	**51.99**	**61.55**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.62%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-905 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.51**	**48.87**	**54.15**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0002	0.0003	78.11	78.11	0.01%	3.88%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-905 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**24.79**	**20.98**	**38.25**	**61.46**	**58.08**	**102.32**	**111.88**	**115.96**	**88.73**	**76.16**	**42.73**	**19.79**	**761.12**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0236	0.0244	0.0320	0.0399	0.0369	0.0498	0.0504	0.0482	0.0448	0.0475	0.0358	0.0193		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9943	0.9948	0.9934	0.9911	0.9912	0.9880	0.9874	0.9862	0.9884	0.9910	0.9932	0.9944		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.50	523.80	523.43	532.33	533.73	536.16	531.21	523.99	516.44	511.18		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.27	509.78	516.34	525.06	524.79	534.05	535.42	537.65	532.38	524.89	516.97	511.49		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0236**	**0.0244**	**0.0320**	**0.0399**	**0.0369**	**0.0498**	**0.0504**	**0.0482**	**0.0448**	**0.0475**	**0.0358**	**0.0193**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.76	13.08	17.17	21.50	19.96	27.11	27.44	26.40	24.40	25.47	19.11	10.55		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0068	0.0072	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.50	523.80	523.43	532.33	533.73	536.16	531.21	523.99	516.44	511.18		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.67	505.95	511.21	518.42	518.44	525.55	526.87	529.56	525.11	517.62	511.66	508.54		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.05	512.49	519.79	529.18	528.42	539.11	540.59	542.76	537.31	530.36	521.22	513.82		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9943**	**0.9948**	**0.9934**	**0.9911**	**0.9912**	**0.9880**	**0.9874**	**0.9862**	**0.9884**	**0.9910**	**0.9932**	**0.9944**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**199.20**	**163.36**	**226.92**	**293.80**	**299.68**	**392.41**	**424.92**	**460.72**	**378.34**	**305.81**	**227.22**	**194.38**	**3,566.78**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	22,410,164	20,241,438	22,410,164	21,687,255	22,410,164	21,687,255	22,410,164	22,410,164	21,687,255	22,410,164	21,687,255	22,410,164		Specified monthly throughput
N	Annual Turnovers	57.77	57.77	57.77	57.77	57.77	57.77	57.77	57.77	57.77	57.77	57.77	57.77		Calculated Using Equation 1-36
K_N	Turnover Factor	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860	0.6860		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**223.99**	**184.35**	**265.17**	**355.26**	**357.76**	**494.74**	**536.80**	**576.68**	**467.07**	**381.97**	**269.95**	**214.17**	**4,327.90**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	223.99	184.35	265.17	355.26	357.76	494.74	536.80	576.68	467.07	381.97	269.95	214.17	4,327.90	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	27.54	22.98	31.97	41.00	41.37	54.59	58.80	62.37	51.84	44.03	32.39	26.42	495.31	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	8.64	7.29	9.89	12.26	12.39	15.77	16.90	17.75	15.05	13.15	9.98	8.32	147.38	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	6.15	5.20	7.02	8.66	8.75	11.08	11.86	12.44	10.58	9.29	7.08	5.92	104.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1.39	1.15	1.63	2.14	2.16	2.92	3.16	3.38	2.77	2.30	1.66	1.33	25.99	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.86	0.70	1.02	1.37	1.38	1.91	2.07	2.22	1.80	1.47	1.04	0.82	16.67	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.33	0.27	0.41	0.58	0.59	0.87	0.95	1.04	0.81	0.63	0.42	0.32	7.20	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	8.83	7.39	10.23	13.04	13.16	17.24	18.55	19.64	16.39	14.00	10.36	8.48	157.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	1.67	1.36	2.00	2.75	2.77	3.92	4.26	4.60	3.69	2.96	2.05	1.59	33.63	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	2.60	2.15	3.06	4.03	4.07	5.52	5.97	6.37	5.22	4.34	3.11	2.49	48.93	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	2.08	1.71	2.45	3.25	3.27	4.47	4.84	5.18	4.23	3.49	2.49	1.99	39.44	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	2.80	2.32	3.29	4.32	4.36	5.89	6.36	6.79	5.57	4.65	3.34	2.69	52.39	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-905 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.27**	**2.97**	**3.73**	**4.99**	**4.93**	**6.67**	**6.99**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.27**	**2.97**	**3.73**	**4.99**	**4.93**	**6.67**	**6.99**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.27	2.97	3.73	4.99	4.93	6.67	6.99	7.57	6.42	5.02	3.85	3.19	7.57	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.40	0.37	0.45	0.58	0.57	0.74	0.77	0.82	0.71	0.58	0.46	0.39	0.82	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.13	0.12	0.14	0.17	0.17	0.21	0.22	0.23	0.21	0.17	0.14	0.12	0.23	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.09	0.08	0.10	0.12	0.12	0.15	0.15	0.16	0.15	0.12	0.10	0.09	0.16	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.13	0.12	0.14	0.18	0.18	0.23	0.24	0.26	0.23	0.18	0.15	0.13	0.26	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.06	0.05	0.04	0.03	0.02	0.06	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.04	0.03	0.04	0.06	0.06	0.07	0.08	0.08	0.07	0.06	0.04	0.04	0.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.03	0.03	0.03	0.05	0.05	0.06	0.06	0.07	0.06	0.05	0.04	0.03	0.07	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.04	0.04	0.05	0.06	0.06	0.08	0.08	0.09	0.08	0.06	0.05	0.04	0.09	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-932 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	2,060,696	Turnovers Per Year:	30.63
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	34.4
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.00
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**55.03**	**51.82**	**58.24**	**56.20**	**0.0046**	**0.0040**	**0.0052**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.76%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.67%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.88%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**52.83**	**49.54**	**56.12**	**54.10**	**0.0042**	**0.0037**	**0.0048**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0002	0.0003	78.11	78.11	0.01%	3.84%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.73%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.93%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**59.24**	**54.93**	**63.55**	**60.30**	**0.0053**	**0.0045**	**0.0063**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0001	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0004	78.11	78.11	0.01%	3.61%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.56%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.78%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.23%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**68.70**	**63.30**	**74.10**	**70.00**	**0.0076**	**0.0062**	**0.0092**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0004	0.0005	78.11	78.11	0.01%	3.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.33%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0004	92.14	92.14	0.04%	3.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-932 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.20%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**66.64**	**61.63**	**71.65**	**66.90**	**0.0070**	**0.0058**	**0.0084**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.38%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0004	92.14	92.14	0.04%	3.61%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**76.92**	**70.12**	**83.72**	**77.60**	**0.0101**	**0.0079**	**0.0128**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.07%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.15%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.40%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**77.14**	**70.25**	**84.03**	**77.20**	**0.0102**	**0.0080**	**0.0129**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.14%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**80.72**	**74.09**	**87.35**	**81.60**	**0.0115**	**0.0091**	**0.0144**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.81%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.01%	2.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0004	0.0003	0.0004	84.16	84.16	0.01%	2.07%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.19%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.32%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.09%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	0.89%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	0.0001	0.0002	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**77.15**	**71.02**	**83.28**	**79.10**	**0.0102**	**0.0082**	**0.0126**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.14%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.58%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.39%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**71.31**	**64.90**	**77.72**	**74.30**	**0.0083**	**0.0066**	**0.0104**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0004	0.0005	78.11	78.11	0.01%	3.23%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**63.31**	**58.50**	**68.12**	**66.40**	**0.0062**	**0.0052**	**0.0074**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.48%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.46%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.69%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-932 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**56.53**	**53.87**	**59.19**	**59.00**	**0.0048**	**0.0044**	**0.0053**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-932 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**21.93**	**18.85**	**34.39**	**57.15**	**51.04**	**93.69**	**98.62**	**105.94**	**85.00**	**76.82**	**42.79**	**18.89**	**705.11**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0237	0.0244	0.0320	0.0397	0.0369	0.0497	0.0503	0.0481	0.0446	0.0472	0.0356	0.0193		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9941	0.9945	0.9931	0.9902	0.9909	0.9870	0.9869	0.9852	0.9869	0.9893	0.9919	0.9937		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0003**	**0.0002**	**0.0002**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0046	0.0042	0.0053	0.0076	0.0070	0.0101	0.0102	0.0115	0.0102	0.0083	0.0062	0.0048		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	514.70	512.50	518.91	528.37	526.31	536.59	536.81	540.39	536.82	530.98	522.98	516.20		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	513.53	511.23	517.84	527.08	526.04	535.92	536.76	539.50	534.87	527.99	519.88	513.73		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0237**	**0.0244**	**0.0320**	**0.0397**	**0.0369**	**0.0497**	**0.0503**	**0.0481**	**0.0446**	**0.0472**	**0.0356**	**0.0193**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.85	13.15	17.26	21.60	20.03	27.21	27.56	26.52	24.53	25.64	19.25	10.63		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0046	0.0042	0.0053	0.0076	0.0070	0.0101	0.0102	0.0115	0.0102	0.0083	0.0062	0.0048		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0040	0.0037	0.0045	0.0062	0.0058	0.0079	0.0080	0.0091	0.0082	0.0066	0.0052	0.0044		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0052	0.0048	0.0063	0.0092	0.0084	0.0128	0.0129	0.0144	0.0126	0.0104	0.0074	0.0053		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	514.70	512.50	518.91	528.37	526.31	536.59	536.81	540.39	536.82	530.98	522.98	516.20		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	511.49	509.21	514.60	522.97	521.30	529.79	529.92	533.76	530.69	524.57	518.17	513.54		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	517.91	515.79	523.22	533.77	531.32	543.39	543.70	547.02	542.95	537.39	527.79	518.86		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9941**	**0.9945**	**0.9931**	**0.9902**	**0.9909**	**0.9870**	**0.9869**	**0.9852**	**0.9869**	**0.9893**	**0.9919**	**0.9937**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0046	0.0042	0.0053	0.0076	0.0070	0.0101	0.0102	0.0115	0.0102	0.0083	0.0062	0.0048		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**105.85**	**88.34**	**122.92**	**165.11**	**158.72**	**217.10**	**225.70**	**254.10**	**219.27**	**186.95**	**137.69**	**111.96**	**1,993.71**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0046	0.0042	0.0053	0.0076	0.0070	0.0101	0.0102	0.0115	0.0102	0.0083	0.0062	0.0048		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	7,350,757	6,639,393	7,350,757	7,113,636	7,350,757	7,113,636	7,350,757	7,350,757	7,113,636	7,350,757	7,113,636	7,350,757		Specified monthly throughput
N	Annual Turnovers	30.63	30.63	30.63	30.63	30.63	30.63	30.63	30.63	30.63	30.63	30.63	30.63		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**127.77**	**107.19**	**157.31**	**222.26**	**209.76**	**310.79**	**324.33**	**360.04**	**304.27**	**263.77**	**180.48**	**130.85**	**2,698.81**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	127.77	107.19	157.31	222.26	209.76	310.79	324.33	360.04	304.27	263.77	180.48	130.85	2,698.81	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	15.47	13.13	18.63	25.04	23.89	33.54	34.96	38.10	32.80	29.31	20.92	15.72	301.50	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	4.80	4.11	5.68	7.35	7.07	9.53	9.92	10.66	9.31	8.51	6.27	4.85	88.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	3.41	2.93	4.02	5.18	4.99	6.68	6.95	7.46	6.52	5.99	4.43	3.44	62.00	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.79	0.66	0.96	1.33	1.26	1.82	1.90	2.08	1.78	1.56	1.09	0.80	16.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.49	0.41	0.61	0.86	0.81	1.20	1.25	1.39	1.17	1.02	0.70	0.50	10.40	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.19	0.16	0.25	0.38	0.35	0.56	0.59	0.67	0.55	0.46	0.29	0.20	4.65	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	4.95	4.21	5.95	7.93	7.58	10.56	11.00	11.95	10.32	9.27	6.66	5.03	95.41	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.96	0.80	1.20	1.74	1.64	2.48	2.59	2.90	2.43	2.08	1.39	0.99	21.22	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	1.48	1.24	1.80	2.50	2.37	3.43	3.58	3.94	3.36	2.95	2.05	1.51	30.21	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	1.18	0.99	1.45	2.02	1.91	2.79	2.91	3.21	2.73	2.39	1.65	1.21	24.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	1.59	1.34	1.94	2.67	2.54	3.65	3.81	4.19	3.58	3.15	2.20	1.62	32.28	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-932 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.62**	**3.34**	**4.21**	**5.84**	**5.44**	**7.68**	**7.74**	**8.70**	**7.74**	**6.37**	**4.85**	**3.82**	**8.70**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.62**	**3.34**	**4.21**	**5.84**	**5.44**	**7.68**	**7.74**	**8.70**	**7.74**	**6.37**	**4.85**	**3.82**	**8.70**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.62	3.34	4.21	5.84	5.44	7.68	7.74	8.70	7.74	6.37	4.85	3.82	8.70	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.44	0.41	0.50	0.66	0.62	0.83	0.83	0.92	0.83	0.71	0.56	0.46	0.92	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.14	0.13	0.15	0.19	0.18	0.24	0.24	0.26	0.24	0.21	0.17	0.14	0.26	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.10	0.09	0.11	0.14	0.13	0.17	0.17	0.18	0.17	0.14	0.12	0.10	0.18	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.05	0.05	0.04	0.03	0.02	0.05	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.14	0.13	0.16	0.21	0.20	0.26	0.26	0.29	0.26	0.22	0.18	0.15	0.29	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.03	0.03	0.03	0.05	0.04	0.06	0.06	0.07	0.06	0.05	0.04	0.03	0.07	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.04	0.04	0.05	0.07	0.06	0.08	0.09	0.10	0.09	0.07	0.06	0.04	0.10	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.03	0.03	0.04	0.05	0.05	0.07	0.07	0.08	0.07	0.06	0.04	0.04	0.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.09	0.10	0.09	0.08	0.06	0.05	0.10	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-933 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	117,000.00
Net Throughput (bbl/yr):	6,538,211	Turnovers Per Year:	51.17
Maximum Pumping Rate (bbl/hr):	9,330.750		
Shell Height (ft):	48	Maximum Liquid Height (ft):	47.6
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.83
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.20**	**49.03**	**55.37**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0002	0.0003	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.56**	**46.31**	**52.81**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.0002	0.0003	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.82%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.84**	**51.57**	**60.11**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.73%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**64.15**	**58.80**	**69.50**	**62.87**	**0.0064**	**0.0053**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-933 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.78**	**58.81**	**68.75**	**62.40**	**0.0063**	**0.0053**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.69**	**65.94**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0005	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.48%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**74.08**	**67.24**	**80.92**	**72.37**	**0.0091**	**0.0072**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.51**	**69.94**	**83.08**	**75.01**	**0.0100**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0004	0.0006	78.11	78.11	0.01%	3.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.16%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.41%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.55**	**65.48**	**77.62**	**70.36**	**0.0084**	**0.0067**	**0.0103**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0004	0.0005	78.11	78.11	0.01%	3.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.33**	**58.00**	**70.66**	**63.43**	**0.0065**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.0000	0.0001	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.0003	0.0004	78.11	78.11	0.01%	3.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.43%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.77**	**52.03**	**61.51**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0003	0.0003	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.62%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-933 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.52**	**48.90**	**54.14**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.0000	0.0000	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.0002	0.0003	78.11	78.11	0.01%	3.88%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-933 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**28.24**	**23.93**	**43.66**	**70.24**	**66.44**	**117.03**	**127.89**	**132.50**	**101.28**	**86.82**	**48.66**	**22.54**	**869.22**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0235	0.0242	0.0319	0.0397	0.0368	0.0497	0.0502	0.0480	0.0446	0.0472	0.0355	0.0192		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9944	0.9949	0.9935	0.9912	0.9913	0.9881	0.9875	0.9864	0.9885	0.9911	0.9933	0.9945		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34		Calculated Using Equation 1-3
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.82	523.45	532.36	533.75	536.18	531.22	524.00	516.44	511.19		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.29	509.79	516.36	525.10	524.82	534.10	535.46	537.69	532.42	524.91	516.99	511.50		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0235**	**0.0242**	**0.0319**	**0.0397**	**0.0368**	**0.0497**	**0.0502**	**0.0480**	**0.0446**	**0.0472**	**0.0355**	**0.0192**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.68	13.01	17.08	21.42	19.90	27.01	27.34	26.29	24.28	25.32	18.98	10.48		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0068	0.0072	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0103	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.82	523.45	532.36	533.75	536.18	531.22	524.00	516.44	511.19		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.70	505.98	511.24	518.47	518.48	525.61	526.91	529.61	525.15	517.67	511.70	508.57		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.04	512.48	519.78	529.17	528.42	539.11	540.59	542.75	537.29	530.33	521.18	513.81		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9944**	**0.9949**	**0.9935**	**0.9912**	**0.9913**	**0.9881**	**0.9875**	**0.9864**	**0.9885**	**0.9911**	**0.9933**	**0.9945**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**227.63**	**186.68**	**259.29**	**335.83**	**342.55**	**448.69**	**485.69**	**526.61**	**432.30**	**349.44**	**259.55**	**222.12**	**4,076.37**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	23,322,606	21,065,580	23,322,606	22,570,264	23,322,606	22,570,264	23,322,606	23,322,606	22,570,264	23,322,606	22,570,264	23,322,606		Specified monthly throughput
N	Annual Turnovers	51.17	51.17	51.17	51.17	51.17	51.17	51.17	51.17	51.17	51.17	51.17	51.17		Calculated Using Equation 1-36
K_N	Turnover Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**255.87**	**210.61**	**302.95**	**406.07**	**408.98**	**565.72**	**613.58**	**659.11**	**533.57**	**436.25**	**308.20**	**244.66**	**4,945.59**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	255.87	210.61	302.95	406.07	408.98	565.72	613.58	659.11	533.57	436.25	308.20	244.66	4,945.59	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	31.45	26.26	36.53	46.85	47.28	62.41	67.20	71.28	59.22	50.29	36.98	30.18	565.95	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	9.87	8.33	11.29	14.01	14.16	18.03	19.31	20.29	17.19	15.02	11.39	9.50	168.39	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	7.03	5.94	8.02	9.89	10.00	12.67	13.56	14.22	12.08	10.61	8.08	6.77	118.87	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1.58	1.31	1.86	2.45	2.47	3.34	3.61	3.86	3.16	2.63	1.89	1.52	29.70	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.98	0.81	1.16	1.57	1.58	2.18	2.37	2.54	2.06	1.68	1.19	0.94	19.05	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.38	0.31	0.46	0.67	0.67	0.99	1.09	1.19	0.93	0.72	0.48	0.36	8.23	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	10.09	8.44	11.69	14.90	15.04	19.71	21.20	22.44	18.72	15.99	11.82	9.69	179.73	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	1.91	1.56	2.29	3.15	3.16	4.48	4.87	5.26	4.21	3.38	2.34	1.82	38.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	2.97	2.46	3.50	4.61	4.65	6.31	6.82	7.29	5.96	4.95	3.55	2.84	55.91	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	2.37	1.96	2.80	3.71	3.74	5.11	5.53	5.92	4.83	3.99	2.84	2.27	45.06	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	3.20	2.65	3.76	4.94	4.98	6.73	7.27	7.76	6.37	5.31	3.82	3.07	59.86	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-933 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**5.08**	**4.62**	**5.80**	**7.76**	**7.67**	**10.38**	**10.87**	**11.79**	**9.99**	**7.81**	**5.99**	**4.96**	**11.79**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**5.08**	**4.62**	**5.80**	**7.76**	**7.67**	**10.38**	**10.87**	**11.79**	**9.99**	**7.81**	**5.99**	**4.96**	**11.79**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	5.08	4.62	5.80	7.76	7.67	10.38	10.87	11.79	9.99	7.81	5.99	4.96	11.79	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.63	0.58	0.70	0.90	0.89	1.15	1.19	1.27	1.11	0.90	0.72	0.61	1.27	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.20	0.18	0.22	0.27	0.27	0.33	0.34	0.36	0.32	0.27	0.22	0.19	0.36	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.14	0.13	0.15	0.19	0.19	0.23	0.24	0.25	0.23	0.19	0.16	0.14	0.25	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.03	0.03	0.04	0.05	0.05	0.06	0.06	0.07	0.06	0.05	0.04	0.03	0.07	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.04	0.03	0.02	0.02	0.05	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.20	0.18	0.22	0.28	0.28	0.36	0.38	0.40	0.35	0.29	0.23	0.20	0.40	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.04	0.03	0.04	0.06	0.06	0.08	0.09	0.09	0.08	0.06	0.05	0.04	0.09	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.06	0.05	0.07	0.09	0.09	0.12	0.12	0.13	0.11	0.09	0.07	0.06	0.13	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.10	0.11	0.09	0.07	0.06	0.05	0.11	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.06	0.06	0.07	0.09	0.09	0.12	0.13	0.14	0.12	0.10	0.07	0.06	0.14	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-943 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	65,746.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	162.09
Maximum Pumping Rate (bbl/hr):	5,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	45.1
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	4.17
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Gas Oil**	**January**	**52.17**	**48.91**	**55.43**	**51.78**	**0.0229**	**0.0205**	**0.0256**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.03%	1.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0015	0.0013	0.0016	84.16	84.16	0.08%	4.12%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	2.99%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0005	0.0006	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0005	0.0006	106.17	106.17	0.49%	1.81%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**February**	**49.53**	**46.20**	**52.86**	**49.00**	**0.0209**	**0.0187**	**0.0234**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.27%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.03%	1.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0014	0.0012	0.0015	84.16	84.16	0.08%	4.18%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	3.04%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0005	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0004	0.0005	106.17	106.17	0.49%	1.80%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**March**	**55.78**	**51.41**	**60.15**	**54.98**	**0.0259**	**0.0223**	**0.0299**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.03%	1.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0016	0.0014	0.0018	84.16	84.16	0.08%	4.03%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0011	0.0010	0.0013	86.18	86.18	0.04%	2.92%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0007	92.14	92.14	0.12%	1.59%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0006	0.0005	0.0007	106.17	106.17	0.49%	1.83%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**April**	**64.07**	**58.62**	**69.52**	**62.87**	**0.0339**	**0.0284**	**0.0404**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0017	0.0023	84.16	84.16	0.08%	3.85%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0016	86.18	86.18	0.04%	2.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	0.0006	0.0009	92.14	92.14	0.12%	1.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0009	106.17	106.17	0.49%	1.86%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**May**	**63.69**	**58.64**	**68.74**	**62.40**	**0.0335**	**0.0284**	**0.0394**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-943 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0007	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0017	0.0023	84.16	84.16	0.08%	3.86%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0016	86.18	86.18	0.04%	2.76%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0007	0.0006	0.0009	92.14	92.14	0.12%	1.57%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0009	106.17	106.17	0.49%	1.86%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**June**	**72.58**	**65.72**	**79.44**	**70.94**	**0.0445**	**0.0358**	**0.0550**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0010	0.0008	0.0011	78.11	78.11	0.03%	1.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0025	0.0021	0.0030	84.16	84.16	0.08%	3.67%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0017	0.0015	0.0021	86.18	86.18	0.04%	2.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0010	0.0008	0.0012	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0010	0.0008	0.0013	106.17	106.17	0.49%	1.90%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**July**	**73.98**	**67.03**	**80.94**	**72.37**	**0.0465**	**0.0373**	**0.0575**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0010	0.0008	0.0012	78.11	78.11	0.03%	1.29%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0026	0.0022	0.0031	84.16	84.16	0.08%	3.64%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0018	0.0015	0.0021	86.18	86.18	0.04%	2.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0010	0.0008	0.0012	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0011	0.0009	0.0014	106.17	106.17	0.49%	1.90%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**August**	**76.42**	**69.72**	**83.12**	**75.01**	**0.0501**	**0.0406**	**0.0614**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0002	0.0001	0.0002	120.19	120.19	0.35%	0.33%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0011	0.0009	0.0013	78.11	78.11	0.03%	1.28%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0028	0.0023	0.0033	84.16	84.16	0.08%	3.59%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0003	0.0004	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0019	0.0016	0.0023	86.18	86.18	0.04%	2.54%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0011	0.0009	0.0013	92.14	92.14	0.12%	1.53%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0012	0.0009	0.0015	106.17	106.17	0.49%	1.91%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**September**	**71.48**	**65.27**	**77.69**	**70.36**	**0.0430**	**0.0353**	**0.0521**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0002	120.19	120.19	0.35%	0.32%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0009	0.0008	0.0011	78.11	78.11	0.03%	1.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0024	0.0021	0.0029	84.16	84.16	0.08%	3.69%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	0.0002	0.0003	106.17	106.17	0.12%	0.54%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0017	0.0015	0.0020	86.18	86.18	0.04%	2.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0009	0.0008	0.0011	92.14	92.14	0.12%	1.54%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0010	0.0008	0.0012	106.17	106.17	0.49%	1.89%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**October**	**64.28**	**57.77**	**70.79**	**63.43**	**0.0342**	**0.0276**	**0.0420**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0008	0.0006	0.0009	78.11	78.11	0.03%	1.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0020	0.0017	0.0024	84.16	84.16	0.08%	3.84%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0002	0.0003	106.17	106.17	0.12%	0.53%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0014	0.0012	0.0017	86.18	86.18	0.04%	2.75%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0008	0.0006	0.0009	92.14	92.14	0.12%	1.56%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0008	0.0006	0.0010	106.17	106.17	0.49%	1.87%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**November**	**56.74**	**51.84**	**61.64**	**56.23**	**0.0267**	**0.0227**	**0.0314**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.29%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0006	0.0005	0.0007	78.11	78.11	0.03%	1.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0017	0.0014	0.0019	84.16	84.16	0.08%	4.01%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0012	0.0010	0.0013	86.18	86.18	0.04%	2.90%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.08%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0006	0.0005	0.0007	92.14	92.14	0.12%	1.58%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0006	0.0005	0.0007	106.17	106.17	0.49%	1.83%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Gas Oil**	**December**	**51.50**	**48.80**	**54.20**	**51.20**	**0.0224**	**0.0204**	**0.0245**	**160.00**	**130.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 0.1 psia, and a distillation slope of 2.5 °F/vol %.**
	Trimethylbenzene (1,2,4)						0.0001	0.0001	0.0001	120.19	120.19	0.35%	0.28%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.0005	0.0006	78.11	78.11	0.03%	1.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0014	0.0013	0.0015	84.16	84.16	0.08%	4.13%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0002	106.17	106.17	0.12%	0.52%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0010	0.0009	0.0011	86.18	86.18	0.04%	3.00%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.04%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-943 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.07%	0.01%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0005	0.0006	92.14	92.14	0.12%	1.60%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0005	0.0004	0.0005	106.17	106.17	0.49%	1.81%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-943 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**88.65**	**75.65**	**131.60**	**200.69**	**189.85**	**317.52**	**344.89**	**354.28**	**279.24**	**249.20**	**146.82**	**71.96**	**2,450.36**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0005	0.0005	0.0006	0.0008	0.0008	0.0010	0.0011	0.0011	0.0010	0.0008	0.0006	0.0005		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0259	0.0265	0.0344	0.0425	0.0393	0.0529	0.0535	0.0514	0.0479	0.0507	0.0385	0.0214		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9684	0.9711	0.9645	0.9539	0.9545	0.9405	0.9380	0.9335	0.9424	0.9536	0.9634	0.9691		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88		Calculated Using Equation 1-3
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39		Calculated Using Equation 1-17 or 1-19
H_{RD}	**Roof Outage - Cone Roof (ft)**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0005**	**0.0005**	**0.0006**	**0.0008**	**0.0008**	**0.0010**	**0.0011**	**0.0011**	**0.0010**	**0.0008**	**0.0006**	**0.0005**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0209	0.0259	0.0339	0.0335	0.0445	0.0465	0.0501	0.0430	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.20	515.45	523.74	523.36	532.25	533.65	536.09	531.15	523.95	516.41	511.17		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.23	509.72	516.25	524.94	524.65	533.88	535.25	537.50	532.27	524.80	516.92	511.46		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0259**	**0.0265**	**0.0344**	**0.0425**	**0.0393**	**0.0529**	**0.0535**	**0.0514**	**0.0479**	**0.0507**	**0.0385**	**0.0214**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.06	13.34	17.47	21.82	20.19	27.46	27.82	26.81	24.84	26.05	19.58	10.81		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.01	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0209	0.0259	0.0339	0.0335	0.0445	0.0465	0.0501	0.0430	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0205	0.0187	0.0223	0.0284	0.0284	0.0358	0.0373	0.0406	0.0353	0.0276	0.0227	0.0204		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0256	0.0234	0.0299	0.0404	0.0394	0.0550	0.0575	0.0614	0.0521	0.0420	0.0314	0.0245		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.20	515.45	523.74	523.36	532.25	533.65	536.09	531.15	523.95	516.41	511.17		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.58	505.87	511.08	518.29	518.31	525.39	526.70	529.39	524.94	517.44	511.51	508.47		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.10	512.53	519.82	529.19	528.41	539.11	540.61	542.79	537.36	530.46	521.31	513.87		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9684**	**0.9711**	**0.9645**	**0.9539**	**0.9545**	**0.9405**	**0.9380**	**0.9335**	**0.9424**	**0.9536**	**0.9634**	**0.9691**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0229	0.0209	0.0259	0.0339	0.0335	0.0445	0.0465	0.0501	0.0430	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**908.58**	**753.93**	**1,017.66**	**1,271.25**	**1,298.30**	**1,638.02**	**1,763.63**	**1,894.04**	**1,587.34**	**1,322.92**	**1,015.48**	**889.55**	**15,360.71**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0229	0.0209	0.0259	0.0339	0.0335	0.0445	0.0465	0.0501	0.0430	0.0342	0.0267	0.0224		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	35,671,233	32,219,178	35,671,233	34,520,548	35,671,233	34,520,548	35,671,233	35,671,233	34,520,548	35,671,233	34,520,548	35,671,233		Specified monthly throughput
N	Annual Turnovers	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09		Calculated Using Equation 1-36
K_N	Turnover Factor	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**997.24**	**829.59**	**1,149.26**	**1,471.94**	**1,488.16**	**1,955.54**	**2,108.52**	**2,248.32**	**1,866.57**	**1,572.12**	**1,162.30**	**961.51**	**17,811.06**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	997.24	829.59	1,149.26	1,471.94	1,488.16	1,955.54	2,108.52	2,248.32	1,866.57	1,572.12	1,162.30	961.51	17,811.06	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	84.15	70.52	96.01	120.16	121.61	155.89	167.43	177.32	149.26	128.26	96.84	81.29	1,448.74	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	14.38	12.12	16.28	19.99	20.25	25.43	27.23	28.67	24.41	21.33	16.38	13.91	240.39	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	41.07	34.69	46.37	56.64	57.39	71.68	76.68	80.63	68.85	60.42	46.64	39.75	680.83	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	5.18	4.28	6.02	7.84	7.92	10.57	11.42	12.22	10.07	8.37	6.10	4.98	94.96	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	29.81	25.25	33.52	40.59	41.15	50.94	54.41	57.08	48.98	43.30	33.68	28.87	487.58	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.74	0.60	0.86	1.15	1.16	1.58	1.72	1.85	1.51	1.23	0.88	0.71	13.98	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.06	0.05	0.07	0.10	0.11	0.15	0.17	0.18	0.14	0.11	0.08	0.06	1.29	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	15.92	13.30	18.24	23.03	23.30	30.11	32.38	34.36	28.81	24.59	18.42	15.37	277.85	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	2.76	2.25	3.27	4.45	4.49	6.26	6.81	7.37	5.93	4.76	3.33	2.65	54.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	18.06	14.92	21.02	27.45	27.73	37.10	40.11	42.95	35.34	29.33	21.31	17.38	332.69	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.1 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-943 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**15.22**	**13.99**	**17.06**	**22.04**	**21.78**	**28.42**	**29.61**	**31.79**	**27.51**	**22.18**	**17.58**	**14.90**	**31.79**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.03	0.02		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**15.22**	**13.99**	**17.06**	**22.04**	**21.78**	**28.42**	**29.61**	**31.79**	**27.51**	**22.18**	**17.58**	**14.90**	**31.79**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	15.22	13.99	17.06	22.04	21.78	28.42	29.61	31.79	27.51	22.18	17.58	14.90	31.79	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	1.28	1.19	1.43	1.80	1.78	2.27	2.35	2.51	2.20	1.81	1.46	1.26	2.51	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.22	0.20	0.24	0.30	0.30	0.37	0.38	0.41	0.36	0.30	0.25	0.22	0.41	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.63	0.58	0.69	0.85	0.84	1.04	1.08	1.14	1.01	0.85	0.71	0.62	1.14	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.08	0.07	0.09	0.12	0.12	0.15	0.16	0.17	0.15	0.12	0.09	0.08	0.17	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.45	0.43	0.50	0.61	0.60	0.74	0.76	0.81	0.72	0.61	0.51	0.45	0.81	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.24	0.22	0.27	0.34	0.34	0.44	0.45	0.49	0.42	0.35	0.28	0.24	0.49	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.04	0.04	0.05	0.07	0.07	0.09	0.10	0.10	0.09	0.07	0.05	0.04	0.10	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.28	0.25	0.31	0.41	0.41	0.54	0.56	0.61	0.52	0.41	0.32	0.27	0.61	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-19 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	117.00	Tank Volume (bbl):	62,000.00
Net Throughput (bbl/yr):	14,016,000	Turnovers Per Year:	249.12
Maximum Pumping Rate (bbl/hr):	8,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Crude Oil RVP 10.0**	**January**	**52.61**	--	--	**52.35**	**6.5842**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0036	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0114	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0117	--	--	84.16	84.16	0.48%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0323	--	--	86.18	86.18	0.85%	0.85%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0022	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**February**	**50.11**	--	--	**49.77**	**6.3096**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0034	--	--	78.11	78.11	0.14%	0.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0109	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0109	--	--	84.16	84.16	0.48%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0302	--	--	86.18	86.18	0.85%	0.82%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0021	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	--	--	106.17	106.17	0.11%	0.00%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**March**	**56.68**	--	--	**56.15**	**7.0518**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0041	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0123	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0130	--	--	84.16	84.16	0.48%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0360	--	--	86.18	86.18	0.85%	0.88%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0025	--	--	92.14	92.14	0.38%	0.07%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**April**	**65.41**	--	--	**64.62**	**8.1411**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0052	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0165	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0451	--	--	86.18	86.18	0.85%	0.96%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**May**	**65.13**	--	--	**64.28**	**8.1049**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0051	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0164	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0448	--	--	86.18	86.18	0.85%	0.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Crude Oil RVP 10.0**	**June**	**74.40**	--	--	**73.32**	**9.3935**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0065	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0169	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0208	--	--	84.16	84.16	0.48%	0.37%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0565	--	--	86.18	86.18	0.85%	1.04%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0044	--	--	92.14	92.14	0.38%	0.09%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**July**	**75.77**	--	--	**74.71**	**9.5956**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0068	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0173	--	--	54.09	54.09	0.01%	0.20%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0216	--	--	84.16	84.16	0.48%	0.38%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0584	--	--	86.18	86.18	0.85%	1.05%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0045	--	--	92.14	92.14	0.38%	0.09%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0004	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**August**	**77.99**	--	--	**77.06**	**9.9328**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0072	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0180	--	--	54.09	54.09	0.01%	0.196021%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0228	--	--	84.16	84.16	0.48%	0.386427%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.011669%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0616	--	--	86.18	86.18	0.85%	1.068555%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.002057%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.000039%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0048	--	--	92.14	92.14	0.38%	0.089746%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.000271%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0005	--	--	106.17	106.17	0.14%	0.009747%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.011346%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0004	--	--	106.17	106.17	0.11%	0.008081%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**September**	**72.73**	--	--	**71.99**	**9.1498**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0063	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0164	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0200	--	--	84.16	84.16	0.48%	0.37%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0542	--	--	86.18	86.18	0.85%	1.02%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0042	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**October**	**65.22**	--	--	**64.66**	**8.1171**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0051	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0164	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0449	--	--	86.18	86.18	0.85%	0.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product														
Mixture/Product	**Crude Oil RVP 10.0**	**November**	**57.31**	--	--	**56.97**	**7.1266**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0041	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0125	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0133	--	--	84.16	84.16	0.48%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0366	--	--	86.18	86.18	0.85%	0.89%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0026	--	--	92.14	92.14	0.38%	0.07%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**December**	**51.82**	--	--	**51.63**	**6.4969**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0035	--	--	78.11	78.11	0.14%	0.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0112	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0114	--	--	84.16	84.16	0.48%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0316	--	--	86.18	86.18	0.85%	0.84%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0022	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**74.918**	**81.385**	**90.357**	**125.957**	**157.189**	**172.832**	**183.858**	**194.040**	**148.315**	**102.096**	**74.741**	**68.882**	**1,474.571**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.1470	0.1389	0.1615	0.1985	0.1971	0.2485	0.2576	0.2733	0.2380	0.1976	0.1638	0.1444		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	6.5842	6.3096	7.0518	8.1411	8.1049	9.3935	9.5956	9.9328	9.1498	8.1171	7.1266	6.4969		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**286.256**	**347.047**	**360.312**	**539.791**	**735.628**	**771.917**	**818.701**	**861.868**	**630.345**	**392.588**	**275.625**	**255.382**	**6,275.459**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.1470	0.1389	0.1615	0.1985	0.1971	0.2485	0.2576	0.2733	0.2380	0.1976	0.1638	0.1444		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	1,146.23	1,628.47	1,313.82	1,654.63	2,196.76	1,889.56	1,871.39	1,856.29	1,611.10	1,169.74	1,023.44	1,041.07		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**408.722**	**369.169**	**408.722**	**395.538**	**408.722**	**395.538**	**408.722**	**408.722**	**395.538**	**408.722**	**395.538**	**408.722**	**4,812.376**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	1,190,400	1,075,200	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	117	117	117	117	117	117	117	117	117	117	117	117		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**769.897**	**797.600**	**859.391**	**1,061.286**	**1,301.539**	**1,340.287**	**1,411.281**	**1,464.631**	**1,174.198**	**903.406**	**745.904**	**732.987**	**12,562.406**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	769.897	797.600	859.391	1,061.286	1,301.539	1,340.287	1,411.281	1,464.631	1,174.198	903.406	745.904	732.987	12,562.406	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	12.810	12.685	14.099	17.204	20.527	22.019	23.308	24.392	19.425	15.146	12.594	12.335	206.545	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.895	0.885	0.990	1.226	1.466	1.595	1.692	1.778	1.400	1.074	0.884	0.861	14.745	Calculated using Equations 40-1 through 40-9
L_{TI}	Butadiene (1,3) Losses (lb/month)	0.723	0.840	0.897	1.322	1.759	1.886	2.004	2.116	1.558	0.995	0.707	0.653	15.461	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	3.034	3.010	3.362	4.167	4.997	5.422	5.751	6.039	4.755	3.644	2.994	2.916	50.092	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.631	0.576	0.641	0.648	0.688	0.689	0.717	0.728	0.668	0.651	0.614	0.628	7.880	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	6.55	6.69	7.46	9.74	12.00	13.17	14.00	14.78	11.33	8.21	6.48	6.21	116.63	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.2253	0.2045	0.2269	0.2244	0.2351	0.2319	0.2406	0.2426	0.2282	0.2288	0.2185	0.2248	2.7317	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.074	0.067	0.074	0.072	0.074	0.072	0.074	0.074	0.072	0.074	0.072	0.074	0.874	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	1.78	1.66	1.86	2.01	2.23	2.31	2.43	2.50	2.16	1.93	1.74	1.76	24.36	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.066	0.059	0.066	0.064	0.067	0.065	0.068	0.068	0.065	0.066	0.064	0.066	0.783	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.60	0.55	0.61	0.61	0.65	0.64	0.67	0.68	0.63	0.62	0.58	0.60	7.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.87	0.79	0.88	0.87	0.92	0.91	0.95	0.96	0.89	0.89	0.84	0.86	10.64	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.466	0.426	0.473	0.477	0.506	0.505	0.526	0.533	0.491	0.480	0.453	0.464	5.800	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-19 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**3.232**	**3.384**	**3.353**	**3.671**	**3.947**	**4.059**	**4.094**	**4.166**	**3.828**	**3.412**	**3.233**	**3.183**	**4.166**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.101**	**0.121**	**0.121**	**0.175**	**0.211**	**0.240**	**0.247**	**0.261**	**0.206**	**0.137**	**0.104**	**0.093**	**0.261**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.385**	**0.516**	**0.484**	**0.750**	**0.989**	**1.072**	**1.100**	**1.158**	**0.875**	**0.528**	**0.383**	**0.343**	**1.158**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**3.232**	**3.384**	**3.353**	**3.671**	**3.947**	**4.059**	**4.094**	**4.166**	**3.828**	**3.412**	**3.233**	**3.183**	**4.166**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.232	3.384	3.353	3.671	3.947	4.059	4.094	4.166	3.828	3.412	3.233	3.183	4.166	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.063	0.064	0.064	0.069	0.073	0.076	0.077	0.078	0.072	0.066	0.063	0.062	0.078	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.004	0.004	0.006	Calculated using Equations 40-1 through 40-9
L_{TI}	Butadiene (1,3) Losses (lb/hr)	0.001	0.001	0.001	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.003	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.015	0.015	0.015	0.016	0.017	0.018	0.018	0.019	0.017	0.015	0.015	0.014	0.019	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00149	0.00149	0.00149	0.00150	0.00150	0.00151	0.00151	0.00151	0.00150	0.00150	0.00149	0.00149	0.00151	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31	150	1.4	1
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14	5.4	1.1	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	19
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.82	0.53	0.14	24
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-21 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	117.00	Tank Volume (bbl):	62,000.00
Net Throughput (bbl/yr):	14,016,000	Turnovers Per Year:	249.12
Maximum Pumping Rate (bbl/hr):	8,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Crude Oil RVP 10.0**	**January**	**52.61**	--	--	**52.35**	**6.5842**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0036	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0114	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0117	--	--	84.16	84.16	0.48%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0323	--	--	86.18	86.18	0.85%	0.85%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0022	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**February**	**50.11**	--	--	**49.77**	**6.3096**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0034	--	--	78.11	78.11	0.14%	0.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0109	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0109	--	--	84.16	84.16	0.48%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0302	--	--	86.18	86.18	0.85%	0.82%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0021	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	--	--	106.17	106.17	0.11%	0.00%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**March**	**56.68**	--	--	**56.15**	**7.0518**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0041	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0123	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0130	--	--	84.16	84.16	0.48%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0360	--	--	86.18	86.18	0.85%	0.88%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0025	--	--	92.14	92.14	0.38%	0.07%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**April**	**65.41**	--	--	**64.62**	**8.1411**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0052	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0165	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0451	--	--	86.18	86.18	0.85%	0.96%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**May**	**65.13**	--	--	**64.28**	**8.1049**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0051	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0164	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0448	--	--	86.18	86.18	0.85%	0.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Crude Oil RVP 10.0**	**June**	**74.40**	--	--	**73.32**	**9.3935**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0065	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0169	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0208	--	--	84.16	84.16	0.48%	0.37%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0565	--	--	86.18	86.18	0.85%	1.04%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0044	--	--	92.14	92.14	0.38%	0.09%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**July**	**75.77**	--	--	**74.71**	**9.5956**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0068	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0173	--	--	54.09	54.09	0.01%	0.20%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0216	--	--	84.16	84.16	0.48%	0.38%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0584	--	--	86.18	86.18	0.85%	1.05%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0045	--	--	92.14	92.14	0.38%	0.09%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0004	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**August**	**77.99**	--	--	**77.06**	**9.9328**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0072	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0180	--	--	54.09	54.09	0.01%	0.196021%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0228	--	--	84.16	84.16	0.48%	0.386427%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.011669%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0616	--	--	86.18	86.18	0.85%	1.068555%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.002057%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.000039%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0048	--	--	92.14	92.14	0.38%	0.089746%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.000271%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0005	--	--	106.17	106.17	0.14%	0.009747%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.21%	0.011346%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0004	--	--	106.17	106.17	0.11%	0.008081%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**September**	**72.73**	--	--	**71.99**	**9.1498**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0063	--	--	78.11	78.11	0.14%	0.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0164	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0200	--	--	84.16	84.16	0.48%	0.37%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0542	--	--	86.18	86.18	0.85%	1.02%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0042	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0004	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0003	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**October**	**65.22**	--	--	**64.66**	**8.1171**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0051	--	--	78.11	78.11	0.14%	0.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0144	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0164	--	--	84.16	84.16	0.48%	0.34%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0449	--	--	86.18	86.18	0.85%	0.95%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0033	--	--	92.14	92.14	0.38%	0.08%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0003	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Crude Oil RVP 10.0**	**November**	**57.31**	--	--	**56.97**	**7.1266**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0041	--	--	78.11	78.11	0.14%	0.09%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0125	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0133	--	--	84.16	84.16	0.48%	0.31%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0366	--	--	86.18	86.18	0.85%	0.89%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0026	--	--	92.14	92.14	0.38%	0.07%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0003	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**Crude Oil RVP 10.0**	**December**	**51.82**	--	--	**51.63**	**6.4969**	--	--	**207.00**	**50.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-16 and RVP 10 psia.**
	Benzene						0.0035	--	--	78.11	78.11	0.14%	0.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Butadiene (1,3)						0.0112	--	--	54.09	54.09	0.01%	0.19%	Equation 1-26 (Antoine's equation). A = 6.87, B = 941.7, C = 240.4.
	Cyclohexane						0.0114	--	--	84.16	84.16	0.48%	0.30%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0002	--	--	106.17	106.17	0.15%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0316	--	--	86.18	86.18	0.85%	0.84%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0000	--	--	120.19	120.19	0.05%	0.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	--	--	128.17	128.17	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0022	--	--	92.14	92.14	0.38%	0.06%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Trimethylbenzene (1,2,4)						0.0000	--	--	120.19	120.19	0.02%	0.00%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Xylene (m)						0.0002	--	--	106.17	106.17	0.14%	0.01%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0002	--	--	106.17	106.17	0.21%	0.01%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0002	--	--	106.17	106.17	0.11%	0.01%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Pre-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**74.918**	**81.385**	**90.357**	**125.957**	**157.189**	**172.832**	**183.858**	**194.040**	**148.315**	**102.096**	**74.741**	**68.882**	**1,474.571**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.1470	0.1389	0.1615	0.1985	0.1971	0.2485	0.2576	0.2733	0.2380	0.1976	0.1638	0.1444		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	6.5842	6.3096	7.0518	8.1411	8.1049	9.3935	9.5956	9.9328	9.1498	8.1171	7.1266	6.4969		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**286.256**	**347.047**	**360.312**	**539.791**	**735.628**	**771.917**	**818.701**	**861.868**	**630.345**	**392.588**	**275.625**	**255.382**	**6,275.459**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.1470	0.1389	0.1615	0.1985	0.1971	0.2485	0.2576	0.2733	0.2380	0.1976	0.1638	0.1444		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	1,146.23	1,628.47	1,313.82	1,654.63	2,196.76	1,889.56	1,871.39	1,856.29	1,611.10	1,169.74	1,023.44	1,041.07		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**408.722**	**369.169**	**408.722**	**395.538**	**408.722**	**395.538**	**408.722**	**408.722**	**395.538**	**408.722**	**395.538**	**408.722**	**4,812.376**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	1,190,400	1,075,200	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	117	117	117	117	117	117	117	117	117	117	117	117		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**769.897**	**797.600**	**859.391**	**1,061.286**	**1,301.539**	**1,340.287**	**1,411.281**	**1,464.631**	**1,174.198**	**903.406**	**745.904**	**732.987**	**12,562.406**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	769.897	797.600	859.391	1,061.286	1,301.539	1,340.287	1,411.281	1,464.631	1,174.198	903.406	745.904	732.987	12,562.406	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	12.810	12.685	14.099	17.204	20.527	22.019	23.308	24.392	19.425	15.146	12.594	12.335	206.545	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.895	0.885	0.990	1.226	1.466	1.595	1.692	1.778	1.400	1.074	0.884	0.861	14.745	Calculated using Equations 40-1 through 40-9
L_{TI}	Butadiene (1,3) Losses (lb/month)	0.723	0.840	0.897	1.322	1.759	1.886	2.004	2.116	1.558	0.995	0.707	0.653	15.461	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	3.034	3.010	3.362	4.167	4.997	5.422	5.751	6.039	4.755	3.644	2.994	2.916	50.092	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.631	0.576	0.641	0.648	0.688	0.689	0.717	0.728	0.668	0.651	0.614	0.628	7.880	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	6.55	6.69	7.46	9.74	12.00	13.17	14.00	14.78	11.33	8.21	6.48	6.21	116.63	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.2253	0.2045	0.2269	0.2244	0.2351	0.2319	0.2406	0.2426	0.2282	0.2288	0.2185	0.2248	2.7317	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.074	0.067	0.074	0.072	0.074	0.072	0.074	0.074	0.072	0.074	0.072	0.074	0.874	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	1.78	1.66	1.86	2.01	2.23	2.31	2.43	2.50	2.16	1.93	1.74	1.76	24.36	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.066	0.059	0.066	0.064	0.067	0.065	0.068	0.068	0.065	0.066	0.064	0.066	0.783	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.60	0.55	0.61	0.61	0.65	0.64	0.67	0.68	0.63	0.62	0.58	0.60	7.43	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.87	0.79	0.88	0.87	0.92	0.91	0.95	0.96	0.89	0.89	0.84	0.86	10.64	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.466	0.426	0.473	0.477	0.506	0.505	0.526	0.533	0.491	0.480	0.453	0.464	5.800	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-21 (Pre-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**3.232**	**3.384**	**3.353**	**3.671**	**3.947**	**4.059**	**4.094**	**4.166**	**3.828**	**3.412**	**3.233**	**3.183**	**4.166**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	**2.747**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.101**	**0.121**	**0.121**	**0.175**	**0.211**	**0.240**	**0.247**	**0.261**	**0.206**	**0.137**	**0.104**	**0.093**	**0.261**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.385**	**0.516**	**0.484**	**0.750**	**0.989**	**1.072**	**1.100**	**1.158**	**0.875**	**0.528**	**0.383**	**0.343**	**1.158**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**3.232**	**3.384**	**3.353**	**3.671**	**3.947**	**4.059**	**4.094**	**4.166**	**3.828**	**3.412**	**3.233**	**3.183**	**4.166**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.232	3.384	3.353	3.671	3.947	4.059	4.094	4.166	3.828	3.412	3.233	3.183	4.166	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.063	0.064	0.064	0.069	0.073	0.076	0.077	0.078	0.072	0.066	0.063	0.062	0.078	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.004	0.004	0.006	Calculated using Equations 40-1 through 40-9
L_{TI}	Butadiene (1,3) Losses (lb/hr)	0.001	0.001	0.001	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.003	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.015	0.015	0.015	0.016	0.017	0.018	0.018	0.019	0.017	0.015	0.015	0.014	0.019	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00149	0.00149	0.00149	0.00150	0.00150	0.00151	0.00151	0.00151	0.00150	0.00150	0.00149	0.00149	0.00151	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31	150	1.4	1
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14	5.4	1.1	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	19
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.82	0.53	0.14	24
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Post-Project PTE)	S-323	
Location:	Martinez Refinery		
Type of Tank:	Vertical Fixed Roof Tank		

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	70.00	Tank Volume (bbl):	22,000.00
Net Throughput (bbl/yr):	60,833	Turnovers Per Year:	2.61
Maximum Pumping Rate (bbl/hr):	4,700.000		
Shell Height (ft):	40	Maximum Liquid Height (ft):	35
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.66
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{LI}	Z_{VI}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Slop Oil**	**January**	**52.16**	**48.84**	**55.48**	**51.78**	**2.2099**	**2.0643**	**2.3637**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0100	0.0090	0.0110	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0153	0.0139	0.0168	78.11	78.11	1.06%	0.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0055	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0119	0.0109	0.0130	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0007	0.0006	0.0008	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0046	0.0042	0.0051	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**February**	**49.51**	**46.13**	**52.89**	**49.00**	**2.0930**	**1.9511**	**2.2431**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0092	0.0083	0.0102	114.23	114.23	2.00%	0.63%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0142	0.0128	0.0156	78.11	78.11	1.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0047	0.0042	0.0052	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	0.0009	0.0011	106.17	106.17	1.25%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0111	0.0101	0.0121	86.18	86.18	0.55%	0.57%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0005	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0042	0.0038	0.0047	92.14	92.14	1.38%	0.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**March**	**55.75**	**51.33**	**60.17**	**54.98**	**2.3767**	**2.1726**	**2.5959**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0111	0.0097	0.0126	114.23	114.23	2.00%	0.66%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0170	0.0150	0.0192	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0056	0.0049	0.0063	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0015	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0131	0.0116	0.0147	86.18	86.18	0.55%	0.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0006	0.0009	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0052	0.0045	0.0060	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**April**	**64.03**	**58.52**	**69.54**	**62.87**	**2.8002**	**2.5122**	**3.1142**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.0120	0.0164	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0214	0.0183	0.0248	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0060	0.0081	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0141	0.0187	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	0.0057	0.0079	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**May**	**63.64**	**58.55**	**68.73**	**62.40**	**2.7790**	**2.5138**	**3.0662**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0139	0.0120	0.0160	114.23	114.23	2.00%	0.71%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0211	0.0184	0.0242	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	0.0060	0.0079	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0161	0.0141	0.0183	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0012	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0066	0.0057	0.0077	92.14	92.14	1.38%	0.27%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**June**	**72.52**	**65.59**	**79.45**	**70.94**	**3.2954**	**2.8865**	**3.7495**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Isooctane						0.0178	0.0147	0.0214	114.23	114.23	2.00%	0.77%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0268	0.0223	0.0320	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0087	0.0073	0.0104	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0018	0.0028	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0201	0.0169	0.0238	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0018	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0087	0.0070	0.0106	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**July**	**73.92**	**66.90**	**80.94**	**72.37**	**3.3835**	**2.9603**	**3.8537**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0185	0.0152	0.0223	114.23	114.23	2.00%	0.78%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0278	0.0231	0.0332	78.11	78.11	1.06%	0.80%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0090	0.0075	0.0108	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	0.0019	0.0029	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0208	0.0175	0.0246	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0015	0.0012	0.0019	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0090	0.0073	0.0110	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0010	0.0008	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**August**	**76.37**	**69.59**	**83.15**	**75.01**	**3.5420**	**3.1175**	**4.0115**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0197	0.0164	0.0236	114.23	114.23	2.00%	0.80%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0296	0.0248	0.0351	78.11	78.11	1.06%	0.82%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0096	0.0081	0.0114	84.16	84.16	0.36%	0.29%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0025	0.0020	0.0031	106.17	106.17	1.25%	0.10%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0221	0.0187	0.0259	86.18	86.18	0.55%	0.67%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0016	0.0013	0.0020	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0097	0.0079	0.0117	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0011	0.0008	0.0013	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**September**	**71.43**	**65.14**	**77.72**	**70.36**	**3.2282**	**2.8614**	**3.6317**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0173	0.0145	0.0204	114.23	114.23	2.00%	0.76%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0260	0.0220	0.0306	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0085	0.0072	0.0099	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0017	0.0027	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0196	0.0167	0.0228	86.18	86.18	0.55%	0.65%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0017	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0084	0.0069	0.0101	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0011	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**October**	**64.24**	**57.63**	**70.85**	**63.43**	**2.8117**	**2.4678**	**3.1931**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.0117	0.0170	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0215	0.0179	0.0256	78.11	78.11	1.06%	0.75%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0059	0.0083	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0013	0.0021	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0138	0.0193	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0068	0.0055	0.0082	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0009	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**November**	**56.72**	**51.74**	**61.70**	**56.23**	**2.4234**	**2.1910**	**2.6754**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0114	0.0098	0.0132	114.23	114.23	2.00%	0.67%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0174	0.0151	0.0200	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0057	0.0050	0.0066	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0016	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0134	0.0118	0.0153	86.18	86.18	0.55%	0.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0007	0.0010	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0053	0.0046	0.0062	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**December**	**51.48**	**48.73**	**54.23**	**51.20**	**2.1794**	**2.0596**	**2.3048**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0098	0.0090	0.0106	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0150	0.0139	0.0163	78.11	78.11	1.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0053	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0117	0.0108	0.0126	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0006	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0045	0.0041	0.0049	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**1,200.84**	**1,070.33**	**1,670.67**	**2,230.30**	**2,116.90**	**3,125.91**	**3,335.44**	**3,326.94**	**2,799.12**	**2,775.89**	**1,843.69**	**986.39**	**26,482.43**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0322	0.0306	0.0343	0.0398	0.0395	0.0460	0.0471	0.0491	0.0452	0.0399	0.0350	0.0318		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0498	0.0497	0.0686	0.0926	0.0851	0.1275	0.1314	0.1305	0.1143	0.1114	0.0779	0.0410		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.2647	0.2754	0.2508	0.2212	0.2225	0.1944	0.1903	0.1834	0.1977	0.2205	0.2471	0.2674		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0322**	**0.0306**	**0.0343**	**0.0398**	**0.0395**	**0.0460**	**0.0471**	**0.0491**	**0.0452**	**0.0399**	**0.0350**	**0.0318**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.20	509.68	516.19	524.85	524.56	533.76	535.13	537.40	532.18	524.73	516.88	511.44		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0498**	**0.0497**	**0.0686**	**0.0926**	**0.0851**	**0.1275**	**0.1314**	**0.1305**	**0.1143**	**0.1114**	**0.0779**	**0.0410**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.27	13.53	17.69	22.04	20.35	27.71	28.09	27.10	25.15	26.46	19.92	10.99		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.30	0.29	0.42	0.60	0.55	0.86	0.89	0.89	0.77	0.73	0.48	0.25		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	2.0643	1.9511	2.1726	2.5122	2.5138	2.8865	2.9603	3.1175	2.8614	2.4678	2.1910	2.0596		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	2.3637	2.2431	2.5959	3.1142	3.0662	3.7495	3.8537	4.0115	3.6317	3.1931	2.6754	2.3048		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.51	505.80	511.00	518.19	518.22	525.26	526.57	529.26	524.81	517.30	511.41	508.40		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.15	512.56	519.84	529.21	528.40	539.12	540.61	542.82	537.39	530.52	521.37	513.90		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.2647**	**0.2754**	**0.2508**	**0.2212**	**0.2225**	**0.1944**	**0.1903**	**0.1834**	**0.1977**	**0.2205**	**0.2471**	**0.2674**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**932.96**	**802.03**	**995.61**	**1,116.47**	**1,145.58**	**1,291.99**	**1,367.20**	**1,425.23**	**1,269.38**	**1,158.67**	**981.14**	**921.46**	**13,407.73**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	217,000	196,000	217,000	210,000	217,000	210,000	217,000	217,000	210,000	217,000	210,000	217,000		Specified monthly throughput
N	Annual Turnovers	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**2,133.80**	**1,872.36**	**2,666.28**	**3,346.77**	**3,262.48**	**4,417.90**	**4,702.64**	**4,752.17**	**4,068.50**	**3,934.57**	**2,824.83**	**1,907.85**	**39,890.15**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2,133.80	1,872.36	2,666.28	3,346.77	3,262.48	4,417.90	4,702.64	4,752.17	4,068.50	3,934.57	2,824.83	1,907.85	39,890.15	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	48.64	41.65	62.78	84.71	82.30	119.98	129.16	133.10	109.52	99.76	67.10	43.22	1,021.92	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	14.44	12.39	18.59	24.92	24.21	35.05	37.69	38.77	32.02	29.34	19.85	12.84	300.11	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	5.13	4.41	6.58	8.78	8.53	12.28	13.20	13.55	11.23	10.33	7.02	4.56	105.59	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1.42	1.20	1.88	2.67	2.59	3.98	4.32	4.52	3.61	3.15	2.02	1.26	32.62	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	12.38	10.67	15.83	20.92	20.35	29.04	31.15	31.92	26.57	24.63	16.88	11.02	251.35	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/month)	13.72	11.74	17.73	23.98	23.30	34.04	36.66	37.79	31.07	28.25	18.95	12.19	289.42	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.96	0.80	1.29	1.87	1.81	2.85	3.10	3.26	2.57	2.20	1.39	0.85	22.95	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	5.14	4.37	6.70	9.24	8.97	13.36	14.43	14.95	12.16	10.89	7.18	4.56	111.95	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.58	0.49	0.77	1.10	1.07	1.66	1.81	1.89	1.51	1.30	0.83	0.51	13.52	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**849.40**	**808.65**	**907.14**	**1,051.90**	**1,044.70**	**1,218.19**	**1,247.44**	**1,299.92**	**1,195.78**	**1,055.79**	**923.25**	**838.80**	**1,299.92**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.21	2.09	2.38	2.80	2.78	3.30	3.38	3.54	3.23	2.81	2.42	2.18		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	197,400	197,400	197,400	197,400	197,400	197,400	197,400	197,400	197,400	197,400	197,400	197,400		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**849.40**	**808.65**	**907.14**	**1,051.90**	**1,044.70**	**1,218.19**	**1,247.44**	**1,299.92**	**1,195.78**	**1,055.79**	**923.25**	**838.80**	**1,299.92**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	849.40	808.65	907.14	1,051.90	1,044.70	1,218.19	1,247.44	1,299.92	1,195.78	1,055.79	923.25	838.80	1,299.92	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	19.36	17.99	21.36	26.62	26.35	33.08	34.26	36.41	32.19	26.77	21.93	19.00	36.41	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	5.75	5.35	6.32	7.83	7.75	9.67	10.00	10.60	9.41	7.87	6.49	5.64	10.60	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	2.04	1.90	2.24	2.76	2.73	3.39	3.50	3.71	3.30	2.77	2.30	2.00	3.71	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.57	0.52	0.64	0.84	0.83	1.10	1.15	1.24	1.06	0.85	0.66	0.55	1.24	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	4.93	4.61	5.39	6.58	6.52	8.01	8.26	8.73	7.81	6.61	5.52	4.84	8.73	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/hr)	5.46	5.07	6.03	7.54	7.46	9.39	9.72	10.34	9.13	7.58	6.19	5.36	10.34	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.38	0.35	0.44	0.59	0.58	0.78	0.82	0.89	0.76	0.59	0.45	0.37	0.89	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	2.05	1.89	2.28	2.90	2.87	3.68	3.83	4.09	3.57	2.92	2.35	2.01	4.09	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.23	0.21	0.26	0.35	0.34	0.46	0.48	0.52	0.44	0.35	0.27	0.23	0.52	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Daily Max

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	70.00	Tank Volume (bbl):	22,000.00
Net Throughput (bbl/yr):	60,833	Turnovers Per Year:	2.61
Maximum Pumping Rate (bbl/hr):	916.667		
Shell Height (ft):	40	Maximum Liquid Height (ft):	35
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.66
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Slop Oil**	**January**	**52.16**	**48.84**	**55.48**	**51.78**	**2.2099**	**2.06429**	**2.36369**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0100	0.00900	0.01098	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0153	0.01391	0.01684	78.11	78.11	1.06%	0.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0055	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0119	0.0109	0.0130	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0007	0.0006	0.0008	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0046	0.0042	0.0051	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**February**	**49.51**	**46.13**	**52.89**	**49.00**	**2.0930**	**1.95110**	**2.24309**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0092	0.00829	0.01017	114.23	114.23	2.00%	0.63%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0142	0.01284	0.01564	78.11	78.11	1.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0047	0.0042	0.0052	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	0.0009	0.0011	106.17	106.17	1.25%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0111	0.0101	0.0121	86.18	86.18	0.55%	0.57%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0005	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0042	0.0038	0.0047	92.14	92.14	1.38%	0.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**March**	**55.75**	**51.33**	**60.17**	**54.98**	**2.3767**	**2.17261**	**2.59593**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0111	0.00971	0.01259	114.23	114.23	2.00%	0.66%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0170	0.01495	0.01920	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0056	0.0049	0.0063	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0015	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0131	0.0116	0.0147	86.18	86.18	0.55%	0.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0006	0.0009	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0052	0.0045	0.0060	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**April**	**64.03**	**58.52**	**69.54**	**62.87**	**2.8002**	**2.51215**	**3.11423**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.01200	0.01639	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0214	0.01834	0.02476	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0060	0.0081	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0141	0.0187	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	0.0057	0.0079	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**May**	**63.64**	**58.55**	**68.73**	**62.40**	**2.7790**	**2.51378**	**3.06621**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0139	0.01201	0.01603	114.23	114.23	2.00%	0.71%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0211	0.01836	0.02423	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	0.0060	0.0079	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0014	0.0020	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0161	0.0141	0.0183	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0012	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0066	0.0057	0.0077	92.14	92.14	1.38%	0.27%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0008	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**June**	**72.52**	**65.59**	**79.45**	**70.94**	**3.2954**	**2.88653**	**3.74950**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0178	0.01469	0.02141	114.23	114.23	2.00%	0.77%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0268	0.02227	0.03201	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0087	0.0073	0.0104	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0018	0.0028	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0201	0.0169	0.0238	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0018	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-323 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Toluene						0.0087	0.0070	0.0106	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**July**	**73.92**	**66.90**	**80.94**	**72.37**	**3.3835**	**2.96032**	**3.85366**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0185	0.01523	0.02226	114.23	114.23	2.00%	0.78%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0278	0.02307	0.03324	78.11	78.11	1.06%	0.80%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0090	0.0075	0.0108	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	0.0019	0.0029	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0208	0.0175	0.0246	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0015	0.0012	0.0019	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0090	0.0073	0.0110	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0010	0.0008	0.0012	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**August**	**76.37**	**69.59**	**83.15**	**75.01**	**3.5420**	**3.11747**	**4.01152**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0197	0.01642	0.02358	114.23	114.23	2.00%	0.80%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0296	0.02479	0.03513	78.11	78.11	1.06%	0.815754%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0096	0.0081	0.0114	84.16	84.16	0.36%	0.285170%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0025	0.0020	0.0031	106.17	106.17	1.25%	0.095080%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0221	0.0187	0.0259	86.18	86.18	0.55%	0.671657%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0016	0.0013	0.0020	120.19	120.19	1.88%	0.068575%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0097	0.0079	0.0117	92.14	92.14	1.38%	0.314588%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0011	0.0008	0.0013	106.17	106.17	0.75%	0.039802%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**September**	**71.43**	**65.14**	**77.72**	**70.36**	**3.2282**	**2.86142**	**3.63172**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0173	0.01450	0.02045	114.23	114.23	2.00%	0.76%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0260	0.02201	0.03063	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0085	0.0072	0.0099	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	0.0017	0.0027	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0196	0.0167	0.0228	86.18	86.18	0.55%	0.65%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	0.0011	0.0017	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0084	0.0069	0.0101	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	0.0007	0.0011	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**October**	**64.24**	**57.63**	**70.85**	**63.43**	**2.8117**	**2.46777**	**3.19311**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	0.01169	0.01699	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0215	0.01789	0.02563	78.11	78.11	1.06%	0.75%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	0.0059	0.0083	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	0.0013	0.0021	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	0.0138	0.0193	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	0.0008	0.0013	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0068	0.0055	0.0082	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	0.0006	0.0009	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**November**	**56.72**	**51.74**	**61.70**	**56.23**	**2.4234**	**2.19098**	**2.67537**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0114	0.00983	0.01315	114.23	114.23	2.00%	0.67%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0174	0.01513	0.02003	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0057	0.0050	0.0066	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	0.0011	0.0016	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0134	0.0118	0.0153	86.18	86.18	0.55%	0.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	0.0007	0.0010	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0053	0.0046	0.0062	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	0.0004	0.0006	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**December**	**51.48**	**48.73**	**54.23**	**51.20**	**2.1794**	**2.05963**	**2.30476**	**120.00**	**80.00**	--	--	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0098	0.00897	0.01058	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0150	0.01387	0.01625	78.11	78.11	1.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	0.0046	0.0053	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	0.0010	0.0012	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0117	0.0108	0.0126	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	0.0006	0.0007	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0045	0.0041	0.0049	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	0.0004	0.0005	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**1,200.8445**	**1,070.3300**	**1,670.6714**	**2,230.2961**	**2,116.8992**	**3,125.9077**	**3,335.4397**	**3,326.9412**	**2,799.1189**	**2,775.8945**	**1,843.6924**	**986.3901**	**26,482.4256**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0322	0.0306	0.0343	0.0398	0.0395	0.0460	0.0471	0.0491	0.0452	0.0399	0.0350	0.0318		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0498	0.0497	0.0686	0.0926	0.0851	0.1275	0.1314	0.1305	0.1143	0.1114	0.0779	0.0410		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.2647	0.2754	0.2508	0.2212	0.2225	0.1944	0.1903	0.1834	0.1977	0.2205	0.2471	0.2674		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26	91,285.26		Calculated Using Equation 1-3
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720	23.720		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**	**1.22**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0322**	**0.0306**	**0.0343**	**0.0398**	**0.0395**	**0.0460**	**0.0471**	**0.0491**	**0.0452**	**0.0399**	**0.0350**	**0.0318**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.20	509.68	516.19	524.85	524.56	533.76	535.13	537.40	532.18	524.73	516.88	511.44		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0498**	**0.0497**	**0.0686**	**0.0926**	**0.0851**	**0.1275**	**0.1314**	**0.1305**	**0.1143**	**0.1114**	**0.0779**	**0.0410**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.27	13.53	17.69	22.04	20.35	27.71	28.09	27.10	25.15	26.46	19.92	10.99		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.30	0.29	0.42	0.60	0.55	0.86	0.89	0.89	0.77	0.73	0.48	0.25		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	2.0643	1.9511	2.1726	2.5122	2.5138	2.8865	2.9603	3.1175	2.8614	2.4678	2.1910	2.0596		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	2.3637	2.2431	2.5959	3.1142	3.0662	3.7495	3.8537	4.0115	3.6317	3.1931	2.6754	2.3048		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.83	509.18	515.42	523.70	523.31	532.19	533.59	536.04	531.10	523.91	516.39	511.15		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.51	505.80	511.00	518.19	518.22	525.26	526.57	529.26	524.81	517.30	511.41	508.40		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.15	512.56	519.84	529.21	528.40	539.12	540.61	542.82	537.39	530.52	521.37	513.90		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.2647**	**0.2754**	**0.2508**	**0.2212**	**0.2225**	**0.1944**	**0.1903**	**0.1834**	**0.1977**	**0.2205**	**0.2471**	**0.2674**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200	23.7200		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**932.9586**	**802.0330**	**995.6058**	**1,116.4695**	**1,145.5800**	**1,291.9919**	**1,367.2041**	**1,425.2322**	**1,269.3793**	**1,158.6709**	**981.1412**	**921.4620**	**13,407.7284**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	2.2099	2.0930	2.3767	2.8002	2.7790	3.2954	3.3835	3.5420	3.2282	2.8117	2.4234	2.1794		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	217,000	196,000	217,000	210,000	217,000	210,000	217,000	217,000	210,000	217,000	210,000	217,000		Specified monthly throughput
N	Annual Turnovers	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**2,133.803**	**1,872.363**	**2,666.277**	**3,346.766**	**3,262.479**	**4,417.900**	**4,702.644**	**4,752.173**	**4,068.498**	**3,934.565**	**2,824.834**	**1,907.852**	**39,890.154**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2,133.803	1,872.363	2,666.277	3,346.766	3,262.479	4,417.900	4,702.644	4,752.173	4,068.498	3,934.565	2,824.834	1,907.852	39,890.154	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	48.643	41.655	62.784	84.706	82.299	119.979	129.162	133.097	109.516	99.762	67.095	43.222	1,021.921	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	14.439	12.389	18.586	24.915	24.215	35.054	37.694	38.766	32.025	29.339	19.847	12.836	300.105	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	5.125	4.406	6.581	8.776	8.531	12.282	13.196	13.552	11.228	10.332	7.024	4.559	105.591	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	1.421	1.195	1.878	2.672	2.589	3.983	4.323	4.518	3.612	3.151	2.020	1.257	32.621	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	12.38	10.67	15.83	20.92	20.35	29.04	31.15	31.92	26.57	24.63	16.88	11.02	251.35	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/month)	13.719	11.736	17.730	23.983	23.299	34.042	36.659	37.795	31.066	28.247	18.954	12.187	289.419	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.9627	0.8037	1.2852	1.8687	1.8093	2.8461	3.0997	3.2588	2.5744	2.2048	1.3859	0.8499	22.9493	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	5.14	4.37	6.70	9.24	8.97	13.36	14.43	14.95	12.16	10.89	7.18	4.56	111.95	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.58	0.49	0.77	1.10	1.07	1.66	1.81	1.89	1.51	1.30	0.83	0.51	13.52	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-323 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**165.66400**	**157.71545**	**176.92450**	**205.15733**	**203.75417**	**237.59001**	**243.29536**	**253.53116**	**233.21944**	**205.91580**	**180.06662**	**163.59534**	**253.53116**	TCEQ APDG 6250 - Equation 1
M_v	Vapor Molecular Weight (lb/lb-mole)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	2.20990	2.09298	2.37667	2.80020	2.77897	3.29544	3.38345	3.54199	3.22820	2.81168	2.42343	2.17941		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500	38,500		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**165.664**	**157.715**	**176.924**	**205.157**	**203.754**	**237.590**	**243.295**	**253.531**	**233.219**	**205.916**	**180.067**	**163.595**	**253.531**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	165.664	157.715	176.924	205.157	203.754	237.590	243.295	253.531	233.219	205.916	180.067	163.595	253.531	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	3.777	3.509	4.166	5.193	5.140	6.452	6.682	7.101	6.278	5.221	4.277	3.706	7.101	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	1.121	1.044	1.233	1.527	1.512	1.885	1.950	2.068	1.836	1.535	1.265	1.101	2.068	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.398	0.371	0.437	0.538	0.533	0.661	0.683	0.723	0.644	0.541	0.448	0.391	0.723	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.110	0.101	0.125	0.164	0.162	0.214	0.224	0.241	0.207	0.165	0.129	0.108	0.241	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.96	0.90	1.05	1.28	1.27	1.56	1.61	1.70	1.52	1.29	1.08	0.94	1.70	Calculated using Equations 40-1 through 40-9
L_{TI}	Isooctane Losses (lb/hr)	1.065	0.989	1.177	1.470	1.455	1.831	1.897	2.016	1.781	1.478	1.208	1.045	2.016	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.07474	0.06770	0.08528	0.11455	0.11300	0.15306	0.16036	0.17386	0.14757	0.11539	0.08834	0.07288	0.17386	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.40	0.37	0.44	0.57	0.56	0.72	0.75	0.80	0.70	0.57	0.46	0.39	0.80	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.09	0.10	0.09	0.07	0.05	0.04	0.10	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-517 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,135.24
Net Throughput (bbl/yr):	5,803,500	Turnovers Per Year:	79.36
Maximum Pumping Rate (bbl/hr):	5,000.000		
Shell Height (ft):	41.5	Maximum Liquid Height (ft):	37.3
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Feedstock	January	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	February	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	March	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	April	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	May	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	June	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	July	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	August	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	September	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	October	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	November	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	December	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-517 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949	0.9949		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59	272,564.59		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100	24.100		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50	41.50		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65	18.65		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Fully insulated tanks assumed equal to T_{LA}
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**	**0.9949**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000	24.1000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**267.02**	**241.18**	**267.02**	**258.41**	**267.02**	**258.41**	**267.02**	**267.02**	**258.41**	**267.02**	**258.41**	**267.02**	**3,143.97**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	20,701,800	18,698,400	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800		Specified monthly throughput
N	Annual Turnovers	79.36	79.36	79.36	79.36	79.36	79.36	79.36	79.36	79.36	79.36	79.36	79.36		Calculated Using Equation 1-36
K_N	Turnover Factor	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447	0.5447		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**267.02**	**241.18**	**267.02**	**258.41**	**267.02**	**258.41**	**267.02**	**267.02**	**258.41**	**267.02**	**258.41**	**267.02**	**3,143.97**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	267.02	241.18	267.02	258.41	267.02	258.41	267.02	267.02	258.41	267.02	258.41	267.02	3,143.97	Sum of VOC Component Emissions

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-517 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	TCEQ APDG 6250 - Equation 1
M_v	Vapor Molecular Weight (lb/lb-mole)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	**4.97**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	Sum of VOC Component Emissions

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -601 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	50.00	Tank Volume (bbl):	14,000.00
Net Throughput (bbl/yr):	60,833	Turnovers Per Year:	4.35
Maximum Pumping Rate (bbl/hr):	254.388		
Is Roof Supported by Columns? (y/n):	Yes		
No. of Columns:	1	Eff. Col. Diam. (ft):	1
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pan

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.56
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Slop Oil**	**January**	**52.10**	**--**	**--**	**51.78**	**2.2070**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0099	--	--	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0153	--	--	78.11	78.11	1.06%	0.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0119	--	--	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0007	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0046	--	--	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**February**	**49.42**	**--**	**--**	**49.00**	**2.0892**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0092	--	--	114.23	114.23	2.00%	0.63%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0141	--	--	78.11	78.11	1.06%	0.66%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0047	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0010	--	--	106.17	106.17	1.25%	0.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0110	--	--	86.18	86.18	0.55%	0.57%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0042	--	--	92.14	92.14	1.38%	0.23%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**March**	**55.62**	**--**	**--**	**54.98**	**2.3707**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0110	--	--	114.23	114.23	2.00%	0.66%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0169	--	--	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0056	--	--	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0131	--	--	86.18	86.18	0.55%	0.59%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0052	--	--	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**April**	**63.83**	**--**	**--**	**62.87**	**2.7894**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0140	--	--	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0212	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0162	--	--	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	--	--	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**May**	**63.44**	**--**	**--**	**62.40**	**2.7679**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0138	--	--	114.23	114.23	2.00%	0.71%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0210	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0069	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0160	--	--	86.18	86.18	0.55%	0.62%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0066	--	--	92.14	92.14	1.38%	0.27%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-601 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Internal Floating Roof Tank

	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**June**	**72.25**	**--**	**--**	**70.94**	**3.2789**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0177	--	--	114.23	114.23	2.00%	0.77%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0266	--	--	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0086	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0022	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0200	--	--	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0086	--	--	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**July**	**73.66**	**--**	**--**	**72.37**	**3.3667**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0183	--	--	114.23	114.23	2.00%	0.78%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0276	--	--	78.11	78.11	1.06%	0.80%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0090	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0023	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0207	--	--	86.18	86.18	0.55%	0.66%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0015	--	--	120.19	120.19	1.88%	0.07%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0089	--	--	92.14	92.14	1.38%	0.31%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0010	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**August**	**76.14**	**--**	**--**	**75.01**	**3.5267**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0196	--	--	114.23	114.23	2.00%	0.793815%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0294	--	--	78.11	78.11	1.06%	0.814408%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0095	--	--	84.16	84.16	0.36%	0.284739%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0025	--	--	106.17	106.17	1.25%	0.094780%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0220	--	--	86.18	86.18	0.55%	0.670790%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0016	--	--	120.19	120.19	1.88%	0.068320%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0096	--	--	92.14	92.14	1.38%	0.313843%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0011	--	--	106.17	106.17	0.75%	0.039668%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**September**	**71.25**	**--**	**--**	**70.36**	**3.2174**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0172	--	--	114.23	114.23	2.00%	0.76%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0259	--	--	78.11	78.11	1.06%	0.79%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0084	--	--	84.16	84.16	0.36%	0.28%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0021	--	--	106.17	106.17	1.25%	0.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0195	--	--	86.18	86.18	0.55%	0.65%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0014	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0083	--	--	92.14	92.14	1.38%	0.30%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0009	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**October**	**64.11**	**--**	**--**	**63.43**	**2.8044**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0141	--	--	114.23	114.23	2.00%	0.72%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0214	--	--	78.11	78.11	1.06%	0.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0070	--	--	84.16	84.16	0.36%	0.26%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0017	--	--	106.17	106.17	1.25%	0.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0163	--	--	86.18	86.18	0.55%	0.63%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0010	--	--	120.19	120.19	1.88%	0.06%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0067	--	--	92.14	92.14	1.38%	0.28%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0007	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**November**	**56.64**	**--**	**--**	**56.23**	**2.4196**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0114	--	--	114.23	114.23	2.00%	0.67%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0174	--	--	78.11	78.11	1.06%	0.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0057	--	--	84.16	84.16	0.36%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0013	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0134	--	--	86.18	86.18	0.55%	0.60%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0008	--	--	120.19	120.19	1.88%	0.05%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0053	--	--	92.14	92.14	1.38%	0.25%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0005	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
Mixture/Product	**Slop Oil**	**December**	**51.44**	**--**	**--**	**51.20**	**2.1775**	**--**	**--**	**120.00**	**80.00**	**--**	**--**	**Equation 1-25. A = 11.23 and B = 5346.04.**
	Isooctane						0.0097	--	--	114.23	114.23	2.00%	0.64%	Equation 1-26 (Antoine's equation). A = 6.81, B = 1257.8, C = 220.74.
	Benzene						0.0150	--	--	78.11	78.11	1.06%	0.67%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0049	--	--	84.16	84.16	0.36%	0.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0011	--	--	106.17	106.17	1.25%	0.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.0117	--	--	86.18	86.18	0.55%	0.58%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	1.88%	0.04%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Toluene						0.0045	--	--	92.14	92.14	1.38%	0.24%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (o)						0.0004	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-601 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**5.511**	**4.691**	**5.958**	**6.896**	**7.065**	**8.268**	**8.804**	**9.283**	**8.092**	**7.168**	**5.895**	**5.432**	**83.062**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p^*	Value of Vapor Pressure Function	0.0406	0.0382	0.0438	0.0524	0.0520	0.0629	0.0648	0.0683	0.0615	0.0528	0.0448	0.0400		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	2.2070	2.0892	2.3707	2.7894	2.7679	3.2789	3.3667	3.5267	3.2174	2.8044	2.4196	2.1775		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**48.610**	**41.376**	**52.546**	**60.822**	**62.311**	**72.919**	**77.647**	**81.877**	**71.372**	**63.224**	**51.997**	**47.907**	**732.608**	Calculated Using Equation 2-13
p^*	Value of Vapor Pressure Function	0.0406	0.0382	0.0438	0.0524	0.0520	0.0629	0.0648	0.0683	0.0615	0.0528	0.0448	0.0400		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40	176.40		Calculated Using Equation 2-14
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**0.984**	**0.889**	**0.984**	**0.952**	**0.984**	**0.952**	**0.984**	**0.984**	**0.952**	**0.984**	**0.952**	**0.984**	**11.586**	Calculated using Equation 2-19
N_C	Number of Columns:	1	1	1	1	1	1	1	1	1	1	1	1		See 'Stored Liquid Characteristics' table above
F_C	Effective Column Diameter (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Stored Liquid Characteristics' table above
Q	Throughput (bbl/month)	5,167	4,667	5,167	5,000	5,167	5,000	5,167	5,167	5,000	5,167	5,000	5,167		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	50	50	50	50	50	50	50	50	50	50	50	50		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**55.106**	**46.956**	**59.487**	**68.670**	**70.360**	**82.139**	**87.435**	**92.145**	**80.417**	**71.376**	**58.845**	**54.322**	**827.256**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	55.106	46.956	59.487	68.670	70.360	82.139	87.435	92.145	80.417	71.376	58.845	54.322	827.256	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	1.320	1.103	1.463	1.795	1.834	2.284	2.457	2.636	2.220	1.870	1.458	1.295	21.737	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.376	0.314	0.418	0.513	0.525	0.653	0.702	0.753	0.635	0.535	0.417	0.369	6.210	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.134	0.112	0.148	0.181	0.185	0.229	0.246	0.263	0.222	0.188	0.147	0.131	2.185	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.048	0.040	0.053	0.066	0.067	0.085	0.091	0.099	0.082	0.069	0.053	0.047	0.802	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	0.32	0.27	0.35	0.43	0.44	0.54	0.58	0.62	0.52	0.45	0.35	0.31	5.17	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/month)	0.367	0.306	0.408	0.503	0.514	0.643	0.692	0.743	0.625	0.524	0.407	0.360	6.095	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0428	0.0364	0.0466	0.0555	0.0568	0.0699	0.0752	0.0807	0.0680	0.0578	0.0462	0.0422	0.6782	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.14	0.12	0.16	0.20	0.20	0.26	0.28	0.30	0.25	0.21	0.16	0.14	2.42	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.36	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-601 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Internal Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.121**	**0.117**	**0.127**	**0.143**	**0.142**	**0.161**	**0.165**	**0.171**	**0.159**	**0.143**	**0.129**	**0.120**	**0.171**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	**0.048**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		See 'Stored Liquid Characteristics' table above
N_C	Number of Columns	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Tank Identification and Physical Characteristics' table above
F_C	Effective Column Diameter (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		See 'Tank Identification and Physical Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.007**	**0.007**	**0.008**	**0.010**	**0.009**	**0.011**	**0.012**	**0.012**	**0.011**	**0.010**	**0.008**	**0.007**	**0.012**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.065**	**0.062**	**0.071**	**0.084**	**0.084**	**0.101**	**0.104**	**0.110**	**0.099**	**0.085**	**0.072**	**0.064**	**0.110**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.121**	**0.117**	**0.127**	**0.143**	**0.142**	**0.161**	**0.165**	**0.171**	**0.159**	**0.143**	**0.129**	**0.120**	**0.171**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	0.121	0.117	0.127	0.143	0.142	0.161	0.165	0.171	0.159	0.143	0.129	0.120	0.171	Sum of VOC Component Emissions
L_{Ti}	Total HAP Losses (lb/hr)	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.007	0.007	0.006	0.006	0.008	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isooctane Losses (lb/hr)	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/hr)	0.00094	0.00094	0.00095	0.00096	0.00096	0.00098	0.00098	0.00099	0.00098	0.00096	0.00095	0.00094	0.00099	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Fixed Roof Support Col. Well, Built -Up Col., Gasketed Sliding Cover	33	-	-	1
Effective column diameter (ft)	-	-	-	1.00
Default Effective Column Diameter Used?	-	-	-	FALSE
Slotted Guide -Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck leg, IFR-type (total sleeve length approx. 12 in.), Adjustable	7.9	-	-	15

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-620 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,538.11
Net Throughput (bbl/yr):	5,803,500	Turnovers Per Year:	78.93
Maximum Pumping Rate (bbl/hr):	6,600.000		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{LI}	Z_{VI}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Feedstock	January	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	February	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	March	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	April	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	May	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	June	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	July	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	August	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	September	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	October	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	November	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	December	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-620 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953	0.9953		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00	254,469.00		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75	18.75		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Fully insulated tanks assumed equal to T_{LA}
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**	**0.9953**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000	22.5000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**268.04**	**242.10**	**268.04**	**259.40**	**268.04**	**259.40**	**268.04**	**268.04**	**259.40**	**268.04**	**259.40**	**268.04**	**3,155.99**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	20,701,800	18,698,400	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800		Specified monthly throughput
N	Annual Turnovers	78.93	78.93	78.93	78.93	78.93	78.93	78.93	78.93	78.93	78.93	78.93	78.93		Calculated Using Equation 1-36
K_N	Turnover Factor	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468	0.5468		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50	37.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**268.04**	**242.10**	**268.04**	**259.40**	**268.04**	**259.40**	**268.04**	**268.04**	**259.40**	**268.04**	**259.40**	**268.04**	**3,155.99**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	268.04	242.10	268.04	259.40	268.04	259.40	268.04	268.04	259.40	268.04	259.40	268.04	3,155.99	Sum of VOC Component Emissions

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-620 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	TCEQ APDG 6250 - Equation 1
M_v	Vapor Molecular Weight (lb/lb-mole)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200	277,200		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	**6.56**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	Sum of VOC Component Emissions

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,538.11
Net Throughput (bbl/yr):	12,045,000	Turnovers Per Year:	159.44
Maximum Pumping Rate (bbl/hr):	2,416.667		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-621 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Stripped HDO Product	January	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	February	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	March	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	April	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	May	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	June	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	July	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	August	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	September	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	October	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	November	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Stripped HDO Product	December	100.00	--	--	100.00	1.2926	--	--	140.00	100.00	--	--	Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 1.2 psia, and a distillation slope of 2 °F/vol %.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.10%	0.02%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**59.990**	**68.978**	**65.886**	**74.720**	**93.870**	**81.875**	**84.043**	**83.575**	**73.362**	**60.833**	**53.708**	**56.153**	**856.992**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926	1.2926		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**28.033**	**28.036**	**29.140**	**30.183**	**34.062**	**31.434**	**32.385**	**32.304**	**29.942**	**28.193**	**26.292**	**27.296**	**357.299**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230	0.0230		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	143.78	159.20	149.45	159.96	174.70	166.60	166.10	165.68	158.68	144.60	139.34	139.99		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**69.940**	**63.172**	**69.940**	**67.684**	**69.940**	**67.684**	**69.940**	**69.940**	**67.684**	**69.940**	**67.684**	**69.940**	**823.487**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	1,023,000	924,000	1,023,000	990,000	1,023,000	990,000	1,023,000	1,023,000	990,000	1,023,000	990,000	1,023,000		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80		From Chemical Properties Database
D	Tank Diameter (ft)	120	120	120	120	120	120	120	120	120	120	120	120		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**157.964**	**160.185**	**164.966**	**172.587**	**197.871**	**180.993**	**186.368**	**185.819**	**170.987**	**158.966**	**147.684**	**153.389**	**2,037.778**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	157.964	160.185	164.966	172.587	197.871	180.993	186.368	185.819	170.987	158.966	147.684	153.389	2,037.778	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.088	0.083	0.089	0.089	0.096	0.091	0.094	0.093	0.089	0.088	0.084	0.087	1.070	Sum of HAP Component Emissions
L_{IB}	Isopropyl benzene Losses (lb/month)	0.0878	0.0829	0.0892	0.0890	0.0959	0.0907	0.0936	0.0935	0.0887	0.0880	0.0839	0.0869	1.0700	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-621 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.284**	**0.310**	**0.293**	**0.311**	**0.337**	**0.323**	**0.322**	**0.321**	**0.309**	**0.285**	**0.276**	**0.277**	**0.337**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	**0.165**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	57.54	57.54	57.54	57.54	57.54	57.54	57.54	57.54	57.54	57.54	57.54	57.54		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.081**	**0.103**	**0.089**	**0.104**	**0.126**	**0.114**	**0.113**	**0.112**	**0.102**	**0.082**	**0.075**	**0.075**	**0.126**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.038**	**0.042**	**0.039**	**0.042**	**0.046**	**0.044**	**0.044**	**0.043**	**0.042**	**0.038**	**0.037**	**0.037**	**0.046**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.284**	**0.310**	**0.293**	**0.311**	**0.337**	**0.323**	**0.322**	**0.321**	**0.309**	**0.285**	**0.276**	**0.277**	**0.337**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.284	0.310	0.293	0.311	0.337	0.323	0.322	0.321	0.309	0.285	0.276	0.277	0.337	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00019	0.00019	0.00019	0.00019	0.00020	0.00020	0.00020	0.00020	0.00019	0.00019	0.00019	0.00019	0.00020	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	24
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable.	0.49	0.16	0.14	28

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-622 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	75,000.00
Net Throughput (bbl/yr):	17,410,500	Turnovers Per Year:	240.06
Maximum Pumping Rate (bbl/hr):	6,700.000		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{LI}	Z_{VI}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.20**	**49.04**	**55.36**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**49.56**	**46.32**	**52.81**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**55.84**	**51.58**	**60.10**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**64.16**	**58.81**	**69.51**	**62.87**	**0.0064**	**0.0053**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**63.78**	**58.81**	**68.75**	**62.40**	**0.0063**	**0.0053**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**72.70**	**65.96**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**74.09**	**67.26**	**80.92**	**72.37**	**0.0091**	**0.0072**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**76.52**	**69.96**	**83.08**	**75.01**	**0.0100**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**71.56**	**65.50**	**77.62**	**70.36**	**0.0084**	**0.0067**	**0.0103**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**64.34**	**58.02**	**70.66**	**63.43**	**0.0065**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**56.78**	**52.05**	**61.51**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.52**	**48.91**	**54.13**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-622 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**15.93**	**13.56**	**25.50**	**41.83**	**39.33**	**70.76**	**77.37**	**79.95**	**60.79**	**52.26**	**28.68**	**12.34**	**518.32**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0207	0.0215	0.0291	0.0369	0.0341	0.0469	0.0474	0.0452	0.0418	0.0443	0.0327	0.0164		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9951	0.9956	0.9944	0.9923	0.9924	0.9896	0.9891	0.9881	0.9900	0.9923	0.9942	0.9952		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44	257,296.44		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750	22.750		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.83	523.45	532.37	533.76	536.19	531.23	524.01	516.45	511.19		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.29	509.80	516.37	525.11	524.84	534.12	535.48	537.70	532.43	524.92	516.99	511.50		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0207**	**0.0215**	**0.0291**	**0.0369**	**0.0341**	**0.0469**	**0.0474**	**0.0452**	**0.0418**	**0.0443**	**0.0327**	**0.0164**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.65	12.98	17.05	21.39	19.88	26.98	27.31	26.25	24.23	25.26	18.93	10.45		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0068	0.0072	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0103	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.83	523.45	532.37	533.76	536.19	531.23	524.01	516.45	511.19		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.71	505.99	511.25	518.48	518.48	525.63	526.93	529.63	525.17	517.69	511.72	508.58		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.03	512.48	519.77	529.18	528.42	539.11	540.59	542.75	537.29	530.33	521.18	513.80		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9951**	**0.9956**	**0.9944**	**0.9923**	**0.9924**	**0.9896**	**0.9891**	**0.9881**	**0.9900**	**0.9923**	**0.9942**	**0.9952**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500	22.7500		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**234.77**	**192.53**	**267.42**	**346.48**	**353.28**	**462.91**	**501.08**	**543.30**	**446.00**	**360.52**	**267.79**	**229.09**	**4,205.17**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	62,105,400	56,095,200	62,105,400	60,102,000	62,105,400	60,102,000	62,105,400	62,105,400	60,102,000	62,105,400	60,102,000	62,105,400		Specified monthly throughput
N	Annual Turnovers	240.06	240.06	240.06	240.06	240.06	240.06	240.06	240.06	240.06	240.06	240.06	240.06		Calculated Using Equation 1-36
K_N	Turnover Factor	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916	0.2916		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**250.70**	**206.09**	**292.92**	**388.31**	**392.61**	**533.67**	**578.45**	**623.25**	**506.80**	**412.78**	**296.47**	**241.43**	**4,723.49**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	250.70	206.09	292.92	388.31	392.61	533.67	578.45	623.25	506.80	412.78	296.47	241.43	4,723.49	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	3.14	2.57	3.68	4.89	4.95	6.73	7.29	7.86	6.39	5.20	3.72	3.02	59.45	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	3.14	2.57	3.68	4.89	4.95	6.73	7.29	7.86	6.39	5.20	3.72	3.02	59.45	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-622 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.65**	**3.32**	**4.16**	**5.58**	**5.50**	**7.46**	**7.81**	**8.47**	**7.18**	**5.61**	**4.30**	**3.56**	**8.47**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400	281,400		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.65**	**3.32**	**4.16**	**5.58**	**5.50**	**7.46**	**7.81**	**8.47**	**7.18**	**5.61**	**4.30**	**3.56**	**8.47**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.65	3.32	4.16	5.58	5.50	7.46	7.81	8.47	7.18	5.61	4.30	3.56	8.47	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.10	0.11	0.09	0.07	0.05	0.04	0.11	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.05	0.04	0.05	0.07	0.07	0.09	0.10	0.11	0.09	0.07	0.05	0.04	0.11	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	95,000.00
Net Throughput (bbl/yr):	351,000	Turnovers Per Year:	3.66
Maximum Pumping Rate (bbl/hr):	3,406.299		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-650 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sour Water**	**January**	**52.61**	--	--	**52.34**	**0.0043**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0114	--	--	78.11	78.11	0.50%	160.14%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.32%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.68%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**February**	**50.11**	--	--	**49.76**	**0.0039**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0106	--	--	78.11	78.11	0.50%	163.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.30%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.73%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**March**	**56.67**	--	--	**56.13**	**0.0050**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0128	--	--	78.11	78.11	0.50%	154.12%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.34%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.60%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**April**	**65.40**	--	--	**64.59**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.40%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**May**	**65.12**	--	--	**64.25**	**0.0068**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0162	--	--	78.11	78.11	0.50%	142.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**June**	**74.39**	--	--	**73.29**	**0.0095**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0207	--	--	78.11	78.11	0.50%	130.75%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.45%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0013	--	--	106.17	106.17	0.50%	11.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-650 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Sour Water**	**July**	**75.76**	--	--	**74.67**	**0.0100**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0215	--	--	78.11	78.11	0.50%	129.12%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.46%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0014	--	--	106.17	106.17	0.50%	11.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**August**	**77.99**	--	--	**77.03**	**0.0108**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0227	--	--	78.11	78.11	0.50%	126.518834%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.220116%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.474392%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0015	--	--	106.17	106.17	0.50%	11.089332%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**September**	**72.72**	--	--	**71.96**	**0.0090**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0198	--	--	78.11	78.11	0.50%	132.77%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.44%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0012	--	--	106.17	106.17	0.50%	11.22%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**October**	**65.22**	--	--	**64.64**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.30%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**November**	**57.30**	--	--	**56.96**	**0.0051**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0131	--	--	78.11	78.11	0.50%	153.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.35%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.59%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**December**	**51.82**	--	--	**51.62**	**0.0042**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0112	--	--	78.11	78.11	0.50%	161.33%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.31%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.70%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.289**	**0.302**	**0.370**	**0.579**	**0.720**	**0.875**	**0.942**	**1.012**	**0.739**	**0.468**	**0.309**	**0.262**	**6.867**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0043	0.0039	0.0050	0.0069	0.0068	0.0095	0.0100	0.0108	0.0090	0.0069	0.0051	0.0042		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.115**	**0.105**	**0.140**	**0.201**	**0.225**	**0.289**	**0.312**	**0.336**	**0.259**	**0.186**	**0.129**	**0.109**	**2.405**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	143.34	159.35	149.22	160.14	175.54	167.06	166.54	166.11	158.81	144.18	138.75	139.42		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**2.138**	**1.932**	**2.138**	**2.070**	**2.138**	**2.070**	**2.138**	**2.138**	**2.070**	**2.138**	**2.070**	**2.138**	**25.179**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	29,811	26,926	29,811	28,849	29,811	28,849	29,811	29,811	28,849	29,811	28,849	29,811		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	140	140	140	140	140	140	140	140	140	140	140	140		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**2.542**	**2.338**	**2.648**	**2.849**	**3.084**	**3.233**	**3.393**	**3.487**	**3.067**	**2.792**	**2.507**	**2.510**	**34.451**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2.542	2.338	2.648	2.849	3.084	3.233	3.393	3.487	3.067	2.792	2.507	2.510	34.451	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.739	0.755	0.890	1.243	1.502	1.701	1.810	1.908	1.485	1.052	0.765	0.687	14.536	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.658	0.677	0.796	1.118	1.357	1.532	1.630	1.717	1.335	0.941	0.681	0.609	13.051	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.011	0.010	0.012	0.012	0.012	0.013	0.013	0.014	0.012	0.012	0.011	0.011	0.144	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.16	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.06	0.06	0.07	0.10	0.12	0.14	0.15	0.16	0.12	0.09	0.06	0.05	1.18	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-650 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.245**	**0.245**	**0.245**	**0.245**	**0.246**	**0.246**	**0.246**	**0.246**	**0.246**	**0.245**	**0.245**	**0.245**	**0.246**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	**0.244**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10	81.10		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.001**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.245**	**0.245**	**0.245**	**0.245**	**0.246**	**0.246**	**0.246**	**0.246**	**0.246**	**0.245**	**0.245**	**0.245**	**0.246**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.245	0.245	0.245	0.245	0.246	0.246	0.246	0.246	0.246	0.245	0.245	0.245	0.246	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.007	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.003	0.002	0.002	0.002	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	4
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	10
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	33

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-651 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	106,928.40
Net Throughput (bbl/yr):	5,631,429	Turnovers Per Year:	52.66
Maximum Pumping Rate (bbl/hr):	1,113.800		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sour Water**	**January**	**52.60**	--	--	**52.33**	**0.0043**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0114	--	--	78.11	78.11	0.50%	160.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.32%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.68%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**February**	**50.11**	--	--	**49.74**	**0.0039**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0106	--	--	78.11	78.11	0.50%	163.97%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.30%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.73%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**March**	**56.66**	--	--	**56.10**	**0.0050**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0128	--	--	78.11	78.11	0.50%	154.14%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.34%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.60%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**April**	**65.39**	--	--	**64.55**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.07%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.40%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**May**	**65.11**	--	--	**64.21**	**0.0068**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0162	--	--	78.11	78.11	0.50%	142.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**June**	**74.37**	--	--	**73.23**	**0.0095**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0207	--	--	78.11	78.11	0.50%	130.77%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.45%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0013	--	--	106.17	106.17	0.50%	11.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**July**	**75.74**	--	--	**74.62**	**0.0100**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0215	--	--	78.11	78.11	0.50%	129.14%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.46%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0014	--	--	106.17	106.17	0.50%	11.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**August**	**77.97**	--	--	**76.98**	**0.0108**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0227	--	--	78.11	78.11	0.50%	126.535106%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.220076%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.474300%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0015	--	--	106.17	106.17	0.50%	11.089700%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**September**	**72.71**	--	--	**71.92**	**0.0090**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0198	--	--	78.11	78.11	0.50%	132.78%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0001	--	--	94.11	94.11	0.50%	0.44%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0012	--	--	106.17	106.17	0.50%	11.22%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**October**	**65.21**	--	--	**64.62**	**0.0069**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0163	--	--	78.11	78.11	0.50%	142.31%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-651 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.39%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0010	--	--	106.17	106.17	0.50%	11.41%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**November**	**57.30**	**--**	**--**	**56.94**	**0.0051**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0131	--	--	78.11	78.11	0.50%	153.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.16%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.35%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0007	--	--	106.17	106.17	0.50%	11.59%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
Mixture/Product	**Sour Water**	**December**	**51.82**	**--**	**--**	**51.61**	**0.0042**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.1 and B = 10015.6.**
	Benzene						0.0112	--	--	78.11	78.11	0.50%	161.33%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	--	--	108.14	108.14	0.50%	0.15%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Phenol						0.0000	--	--	94.11	94.11	0.50%	0.31%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0006	--	--	106.17	106.17	0.50%	11.70%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-651 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.289**	**0.302**	**0.370**	**0.579**	**0.720**	**0.874**	**0.941**	**1.012**	**0.739**	**0.468**	**0.309**	**0.262**	**6.864**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0043	0.0039	0.0050	0.0069	0.0068	0.0095	0.0100	0.0108	0.0090	0.0069	0.0051	0.0042		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.114**	**0.104**	**0.138**	**0.199**	**0.223**	**0.286**	**0.309**	**0.333**	**0.256**	**0.183**	**0.127**	**0.107**	**2.378**	Calculated Using Equation 2-13
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	141.26	157.64	147.27	158.45	174.21	165.54	165.00	164.56	157.09	142.13	136.57	137.26		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**34.310**	**30.990**	**34.310**	**33.203**	**34.310**	**33.203**	**34.310**	**34.310**	**33.203**	**34.310**	**33.203**	**34.310**	**403.973**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	478,286	432,000	478,286	462,857	478,286	462,857	478,286	478,286	462,857	478,286	462,857	478,286		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		From Chemical Properties Database
D	Tank Diameter (ft)	140	140	140	140	140	140	140	140	140	140	140	140		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**34.712**	**31.395**	**34.818**	**33.981**	**35.253**	**34.364**	**35.560**	**35.655**	**34.198**	**34.961**	**33.639**	**34.679**	**413.215**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	34.712	31.395	34.818	33.981	35.253	34.364	35.560	35.655	34.198	34.961	33.639	34.679	413.215	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	1.379	1.334	1.530	1.862	2.143	2.319	2.449	2.546	2.103	1.691	1.384	1.327	22.067	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.816	0.820	0.954	1.270	1.515	1.683	1.786	1.873	1.487	1.098	0.833	0.767	14.904	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-m) Losses (lb/month)	0.172	0.156	0.172	0.167	0.173	0.168	0.174	0.175	0.168	0.173	0.167	0.172	2.038	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.17	0.16	0.17	0.17	0.18	0.17	0.18	0.18	0.17	0.17	0.17	0.17	2.06	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	0.22	0.20	0.23	0.25	0.28	0.30	0.31	0.32	0.28	0.25	0.22	0.21	3.07	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-651 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.080**	**0.081**	**0.081**	**0.081**	**0.081**	**0.082**	**0.082**	**0.082**	**0.081**	**0.081**	**0.081**	**0.080**	**0.082**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	**0.080**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52	26.52		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.001**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.080**	**0.081**	**0.081**	**0.081**	**0.081**	**0.082**	**0.082**	**0.082**	**0.081**	**0.081**	**0.081**	**0.080**	**0.082**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.080	0.081	0.081	0.081	0.081	0.082	0.082	0.082	0.081	0.081	0.081	0.080	0.082	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.002	0.004	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.003	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	4
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3 -in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	18
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	12

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	56,000.00
Net Throughput (bbl/yr):	365,000	Turnovers Per Year:	6.52
Maximum Pumping Rate (bbl/hr):	2,286.735		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Naphtha**	**January**	**52.58**	--	--	**52.24**	**3.4782**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0112	--	--	78.11	78.11	1.00%	0.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0054	--	--	84.16	84.16	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.2501	--	--	86.18	86.18	14.91%	9.11%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0026	--	--	92.14	92.14	1.00%	0.10%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0005	--	--	106.17	106.17	0.75%	0.02%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**February**	**50.07**	--	--	**49.62**	**3.3025**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0104	--	--	78.11	78.11	1.00%	0.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0050	--	--	84.16	84.16	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.2337	--	--	86.18	86.18	14.91%	8.97%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0024	--	--	92.14	92.14	1.00%	0.10%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0004	--	--	106.17	106.17	0.75%	0.02%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**March**	**56.61**	--	--	**55.92**	**3.7770**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0125	--	--	78.11	78.11	1.00%	0.38%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0060	--	--	84.16	84.16	0.50%	0.20%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.2786	--	--	86.18	86.18	14.91%	9.35%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0030	--	--	92.14	92.14	1.00%	0.11%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0006	--	--	106.17	106.17	0.75%	0.02%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**April**	**65.30**	--	--	**64.28**	**4.4917**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0159	--	--	78.11	78.11	1.00%	0.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0076	--	--	84.16	84.16	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.3490	--	--	86.18	86.18	14.91%	9.85%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0039	--	--	92.14	92.14	1.00%	0.12%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0008	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**May**	**65.02**	--	--	**63.91**	**4.4669**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0158	--	--	78.11	78.11	1.00%	0.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0076	--	--	84.16	84.16	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.3465	--	--	86.18	86.18	14.91%	9.83%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0039	--	--	92.14	92.14	1.00%	0.12%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0008	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**June**	**74.26**	--	--	**72.86**	**5.3381**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0202	--	--	78.11	78.11	1.00%	0.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0096	--	--	84.16	84.16	0.50%	0.22%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.4362	--	--	86.18	86.18	14.91%	10.36%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0051	--	--	92.14	92.14	1.00%	0.13%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0010	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0003	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**July**	**75.63**	--	--	**74.25**	**5.4778**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0209	--	--	78.11	78.11	1.00%	0.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0100	--	--	84.16	84.16	0.50%	0.23%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.4509	--	--	86.18	86.18	14.91%	10.43%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0053	--	--	92.14	92.14	1.00%	0.13%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0011	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0003	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**August**	**77.87**	--	--	**76.66**	**5.7137**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0222	--	--	78.11	78.11	1.00%	0.446166%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0105	--	--	84.16	84.16	0.50%	0.228377%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0008	--	--	106.17	106.17	0.50%	0.022319%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.4760	--	--	86.18	86.18	14.91%	10.558639%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0056	--	--	92.14	92.14	1.00%	0.133575%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0011	--	--	106.17	106.17	0.75%	0.031311%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0003	--	--	120.19	120.19	0.50%	0.010770%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Renewable Naphtha**	**September**	**72.63**	--	--	**71.67**	**5.1751**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0194	--	--	78.11	78.11	1.00%	0.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0092	--	--	84.16	84.16	0.50%	0.22%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0007	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.4191	--	--	86.18	86.18	14.91%	10.26%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0048	--	--	92.14	92.14	1.00%	0.13%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0010	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0003	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**October**	**65.15**	--	--	**64.42**	**4.4783**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0159	--	--	78.11	78.11	1.00%	0.41%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0076	--	--	84.16	84.16	0.50%	0.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0005	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.3476	--	--	86.18	86.18	14.91%	9.84%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0039	--	--	92.14	92.14	1.00%	0.12%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0008	--	--	106.17	106.17	0.75%	0.03%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**November**	**57.26**	--	--	**56.83**	**3.8274**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0128	--	--	78.11	78.11	1.00%	0.38%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0061	--	--	84.16	84.16	0.50%	0.20%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0004	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.2834	--	--	86.18	86.18	14.91%	9.38%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0030	--	--	92.14	92.14	1.00%	0.11%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0006	--	--	106.17	106.17	0.75%	0.02%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0002	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**December**	**51.80**	--	--	**51.55**	**3.4231**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0109	--	--	78.11	78.11	1.00%	0.37%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0053	--	--	84.16	84.16	0.50%	0.19%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0003	--	--	106.17	106.17	0.50%	0.02%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.2449	--	--	86.18	86.18	14.91%	9.07%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0025	--	--	92.14	92.14	1.00%	0.10%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0005	--	--	106.17	106.17	0.75%	0.02%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**99.567**	**107.917**	**120.239**	**167.264**	**208.738**	**226.427**	**240.096**	**251.887**	**195.187**	**135.689**	**99.535**	**91.511**	**1,944.057**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0672	0.0634	0.0739	0.0907	0.0901	0.1120	0.1157	0.1221	0.1078	0.0904	0.0751	0.0660		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	3.4782	3.3025	3.7770	4.4917	4.4669	5.3381	5.4778	5.7137	5.1751	4.4783	3.8274	3.4231		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**60.709**	**58.330**	**69.892**	**89.933**	**102.462**	**116.582**	**124.005**	**130.436**	**105.877**	**82.141**	**63.206**	**57.752**	**1,061.327**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0672	0.0634	0.0739	0.0907	0.0901	0.1120	0.1157	0.1221	0.1078	0.0904	0.0751	0.0660		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	156.34	176.42	163.69	177.43	196.94	186.18	185.52	184.97	175.75	157.40	150.62	151.46		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**2.456**	**2.218**	**2.456**	**2.376**	**2.456**	**2.376**	**2.456**	**2.456**	**2.376**	**2.456**	**2.376**	**2.456**	**28.912**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		From Chemical Properties Database
D	Tank Diameter (ft)	100	100	100	100	100	100	100	100	100	100	100	100		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**162.732**	**168.465**	**192.586**	**259.573**	**313.656**	**345.386**	**366.556**	**384.779**	**303.441**	**220.286**	**165.118**	**151.719**	**3,034.296**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	162.732	168.465	192.586	259.573	313.656	345.386	366.556	384.779	303.441	220.286	165.118	151.719	3,034.296	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	15.891	16.160	19.248	27.259	32.849	38.108	40.746	43.289	33.200	23.148	16.593	14.758	321.248	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.617	0.624	0.750	1.073	1.291	1.516	1.624	1.730	1.319	0.912	0.648	0.572	12.676	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.320	0.324	0.388	0.553	0.666	0.777	0.832	0.885	0.677	0.470	0.335	0.297	6.526	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.037	0.036	0.044	0.060	0.070	0.085	0.091	0.098	0.074	0.053	0.039	0.035	0.722	Calculated using Equations 40-1 through 40-9
L_{Ti}	Hexane (n) Losses (lb/month)	14.97	15.24	18.14	25.68	30.96	35.87	38.35	40.73	31.25	21.80	15.63	13.90	302.53	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0235	0.0222	0.0266	0.0344	0.0394	0.0468	0.0501	0.0535	0.0417	0.0313	0.0243	0.0226	0.4165	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.19	0.19	0.23	0.33	0.39	0.47	0.50	0.54	0.41	0.28	0.20	0.18	3.88	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (p) Losses (lb/month)	0.053	0.052	0.063	0.086	0.100	0.120	0.129	0.138	0.106	0.076	0.056	0.051	1.029	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.397**	**0.429**	**0.437**	**0.538**	**0.599**	**0.658**	**0.671**	**0.695**	**0.599**	**0.474**	**0.407**	**0.382**	**0.695**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.134**	**0.161**	**0.162**	**0.232**	**0.281**	**0.314**	**0.323**	**0.339**	**0.271**	**0.182**	**0.138**	**0.123**	**0.339**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.082**	**0.087**	**0.094**	**0.125**	**0.138**	**0.162**	**0.167**	**0.175**	**0.147**	**0.110**	**0.088**	**0.078**	**0.175**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.397**	**0.429**	**0.437**	**0.538**	**0.599**	**0.658**	**0.671**	**0.695**	**0.599**	**0.474**	**0.407**	**0.382**	**0.695**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.397	0.429	0.437	0.538	0.599	0.658	0.671	0.695	0.599	0.474	0.407	0.382	0.695	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.055	0.057	0.059	0.071	0.077	0.086	0.088	0.091	0.079	0.064	0.056	0.053	0.091	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.004	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.05	0.05	0.05	0.06	0.07	0.08	0.08	0.08	0.07	0.06	0.05	0.05	0.08	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00092	0.00092	0.00092	0.00094	0.00094	0.00095	0.00096	0.00096	0.00095	0.00093	0.00092	0.00092	0.00096	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	17
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.49	0.16	0.14	16

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Post-Project PTE, max hourly)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	56,000.00
Net Throughput (bbl/yr):	365,000	Turnovers Per Year:	6.52
Maximum Pumping Rate (bbl/hr):	2,286.735		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Post-Project PTE, max hourly)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Naphtha**	**January**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**February**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**March**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**April**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**May**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**June**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**July**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**August**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.498474%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.252757%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.027731%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.503927%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.157036%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.038823%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.013907%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Post-Project PTE, max hourly)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Mixture/Product	**Renewable Naphtha**	**September**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**October**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**November**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Naphtha**	**December**	**95.00**	--	--	**95.00**	**7.7923**	--	--	**92.00**	**68.00**	--	--	**Equation 1-25. A & B constants determined by using equations in Figure 7.1-15, RVP 8 psia, and a distillation slope of 3 °F/vol %.**
	Benzene						0.0338	--	--	78.11	78.11	1.00%	0.50%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cyclohexane						0.0159	--	--	84.16	84.16	0.50%	0.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0014	--	--	106.17	106.17	0.50%	0.03%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Hexane (n)						0.7073	--	--	86.18	86.18	14.91%	11.50%	Equation 1-26 (Antoine's equation). A = 6.87, B = 1171.5, C = 224.37.
	Toluene						0.0090	--	--	92.14	92.14	1.00%	0.16%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (p)						0.0019	--	--	106.17	106.17	0.75%	0.04%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
	Isopropyl benzene						0.0006	--	--	120.19	120.19	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-692 (Post-Project PTE, max hourly)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**275.484**	**316.756**	**302.560**	**343.125**	**431.061**	**375.981**	**385.935**	**383.787**	**336.886**	**279.352**	**246.634**	**257.863**	**3,935.423**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923	7.7923		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**167.972**	**171.211**	**175.872**	**184.487**	**211.593**	**193.584**	**199.329**	**198.738**	**182.741**	**169.111**	**156.615**	**162.738**	**2,173.989**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	156.34	176.42	163.69	177.43	196.94	186.18	185.52	184.97	175.75	157.40	150.62	151.46		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**2.456**	**2.218**	**2.456**	**2.376**	**2.456**	**2.376**	**2.456**	**2.456**	**2.376**	**2.456**	**2.376**	**2.456**	**28.912**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		From Chemical Properties Database
D	Tank Diameter (ft)	100	100	100	100	100	100	100	100	100	100	100	100		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**445.911**	**490.185**	**480.887**	**529.988**	**645.110**	**571.941**	**587.720**	**584.980**	**522.003**	**450.918**	**405.626**	**423.057**	**6,138.325**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	445.911	490.185	480.887	529.988	645.110	571.941	587.720	584.980	522.003	450.918	405.626	423.057	6,138.325	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	54.737	60.141	59.018	65.023	79.119	70.158	72.094	71.759	64.045	55.350	49.801	51.939	753.182	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	2.235	2.455	2.409	2.654	3.228	2.863	2.942	2.928	2.614	2.260	2.034	2.121	30.743	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	1.133	1.244	1.222	1.345	1.637	1.451	1.492	1.485	1.325	1.146	1.031	1.075	15.587	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.135	0.146	0.145	0.158	0.190	0.170	0.175	0.174	0.156	0.137	0.124	0.129	1.839	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/month)	51.38	56.47	55.40	61.05	74.30	65.88	67.69	67.38	60.13	51.96	46.74	48.75	707.13	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0739	0.0790	0.0788	0.0853	0.1017	0.0911	0.0937	0.0933	0.0841	0.0746	0.0680	0.0708	0.9942	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	0.72	0.79	0.78	0.85	1.03	0.92	0.94	0.94	0.84	0.73	0.66	0.69	9.88	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.191	0.206	0.204	0.223	0.268	0.239	0.246	0.245	0.220	0.193	0.174	0.182	2.589	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Pre-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-692 (Post-Project PTE, max hourly)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.777**	**0.907**	**0.824**	**0.914**	**1.045**	**0.972**	**0.968**	**0.964**	**0.903**	**0.784**	**0.741**	**0.746**	**1.045**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	**0.181**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.370**	**0.471**	**0.407**	**0.477**	**0.579**	**0.522**	**0.519**	**0.516**	**0.468**	**0.375**	**0.343**	**0.347**	**0.579**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.226**	**0.255**	**0.236**	**0.256**	**0.284**	**0.269**	**0.268**	**0.267**	**0.254**	**0.227**	**0.218**	**0.219**	**0.284**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.777**	**0.907**	**0.824**	**0.914**	**1.045**	**0.972**	**0.968**	**0.964**	**0.903**	**0.784**	**0.741**	**0.746**	**1.045**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.777	0.907	0.824	0.914	1.045	0.972	0.968	0.964	0.903	0.784	0.741	0.746	1.045	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.107	0.123	0.113	0.123	0.140	0.131	0.130	0.130	0.122	0.108	0.102	0.103	0.140	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.006	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.003	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Hexane (n) Losses (lb/hr)	0.10	0.11	0.10	0.11	0.13	0.12	0.12	0.12	0.11	0.10	0.09	0.09	0.13	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00099	0.00101	0.00100	0.00101	0.00103	0.00102	0.00102	0.00101	0.00101	0.00099	0.00098	0.00098	0.00103	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Slotted Guide-Pole/Sample Well, Gask Sliding Cover, w. Float,Sleeve,Wiper	11	9.9	0.89	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	17
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.49	0.16	0.14	16

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -699 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	60.00	Tank Volume (bbl):	18,632.73
Net Throughput (bbl/yr):	302,381	Turnovers Per Year:	16.68
Maximum Pumping Rate (bbl/hr):	624.241		
Shell Height (ft):	40	Maximum Liquid Height (ft):	37
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.88
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.15**	**48.78**	**55.52**	**51.78**	**0.0041**	**0.00360**	**0.00465**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.49**	**46.07**	**52.91**	**49.00**	**0.0037**	**0.00323**	**0.00421**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00003	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.82%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.73**	**51.26**	**60.20**	**54.98**	**0.0047**	**0.00396**	**0.00554**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00033	78.11	78.11	0.01%	3.73%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**63.98**	**58.42**	**69.54**	**62.87**	**0.0064**	**0.00519**	**0.00779**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00043	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.60**	**58.48**	**68.72**	**62.40**	**0.0063**	**0.00520**	**0.00756**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-699 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00006	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00042	78.11	78.11	0.01%	3.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.46**	**65.48**	**79.44**	**70.94**	**0.0086**	**0.00672**	**0.01102**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**73.86**	**66.78**	**80.94**	**72.37**	**0.0091**	**0.00705**	**0.01161**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00057	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.32**	**69.48**	**83.16**	**75.01**	**0.0099**	**0.00777**	**0.01252**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00007	0.00011	120.19	120.19	0.14%	0.797967%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00042	0.00060	78.11	78.11	0.01%	3.083139%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000408%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.161532%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.585642%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385807%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.179745%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.409146%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.105798%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.897988%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.177993%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.40**	**65.04**	**77.76**	**70.36**	**0.0083**	**0.00662**	**0.01040**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00009	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00038	0.00053	78.11	78.11	0.01%	3.23%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.21**	**57.50**	**70.92**	**63.43**	**0.0064**	**0.00501**	**0.00818**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00044	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.43%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.70**	**51.64**	**61.76**	**56.23**	**0.0049**	**0.00401**	**0.00587**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00034	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.62%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.47**	**48.68**	**54.26**	**51.20**	**0.0040**	**0.00358**	**0.00444**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.89%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-699 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-699 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.9301**	**4.1311**	**7.3904**	**11.6823**	**10.9854**	**19.2343**	**21.0583**	**21.9661**	**16.9530**	**14.6779**	**8.3616**	**3.9912**	**145.3617**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0264	0.0270	0.0348	0.0427	0.0393	0.0528	0.0534	0.0514	0.0482	0.0514	0.0393	0.0219		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9952	0.9957	0.9945	0.9926	0.9927	0.9900	0.9895	0.9885	0.9903	0.9925	0.9943	0.9953		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96	62,556.96		Calculated Using Equation 1-3
D	Tank Diameter (ft)	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125	22.125		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**	**0.63**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.82	509.16	515.40	523.65	523.27	532.13	533.53	535.99	531.07	523.88	516.37	511.14		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.18	509.65	516.14	524.77	524.47	533.65	535.02	537.30	532.11	524.67	516.85	511.42		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0264**	**0.0270**	**0.0348**	**0.0427**	**0.0393**	**0.0528**	**0.0534**	**0.0514**	**0.0482**	**0.0514**	**0.0393**	**0.0219**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.47	13.70	17.89	22.25	20.50	27.94	28.33	27.36	25.44	26.83	20.23	11.16		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0032	0.0040	0.0052	0.0052	0.0067	0.0070	0.0078	0.0066	0.0050	0.0040	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0082	0.0059	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.82	509.16	515.40	523.65	523.27	532.13	533.53	535.99	531.07	523.88	516.37	511.14		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.45	505.74	510.93	518.09	518.15	525.15	526.45	529.15	524.71	517.17	511.31	508.35		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.19	512.58	519.87	529.21	528.39	539.11	540.61	542.83	537.43	530.59	521.43	513.93		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9952**	**0.9957**	**0.9945**	**0.9926**	**0.9927**	**0.9900**	**0.9895**	**0.9885**	**0.9903**	**0.9925**	**0.9943**	**0.9953**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250	22.1250		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**13.9576**	**11.4382**	**15.8670**	**20.5124**	**20.9157**	**27.3590**	**29.6261**	**32.1548**	**26.4266**	**21.3787**	**15.9042**	**13.6191**	**249.1595**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0086	0.0091	0.0099	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	1,078,630	974,247	1,078,630	1,043,836	1,078,630	1,043,836	1,078,630	1,078,630	1,043,836	1,078,630	1,043,836	1,078,630		Specified monthly throughput
N	Annual Turnovers	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68	16.68		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**18.888**	**15.569**	**23.257**	**32.195**	**31.901**	**46.593**	**50.684**	**54.121**	**43.380**	**36.057**	**24.266**	**17.610**	**394.521**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	18.888	15.569	23.257	32.195	31.901	46.593	50.684	54.121	43.380	36.057	24.266	17.610	394.521	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	2.322	1.942	2.806	3.718	3.692	5.147	5.558	5.859	4.818	4.159	2.912	2.173	45.106	Sum of HAP Component Emissions
L_{Ti}	Benzene Losses (lb/month)	0.729	0.616	0.868	1.112	1.106	1.488	1.598	1.669	1.399	1.243	0.897	0.684	13.411	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cyclohexane Losses (lb/month)	0.519	0.440	0.616	0.786	0.781	1.046	1.122	1.170	0.984	0.878	0.637	0.487	9.466	Calculated using Equations 40-1 through 40-9
L_{Ti}	Ethylbenzene Losses (lb/month)	0.117	0.097	0.143	0.194	0.193	0.276	0.299	0.317	0.257	0.218	0.149	0.109	2.368	Calculated using Equations 40-1 through 40-9
L_{Ti}	Isopropyl benzene Losses (lb/month)	0.0724	0.0595	0.0894	0.1242	0.1230	0.1799	0.1956	0.2088	0.1675	0.1391	0.0933	0.0675	1.5201	Calculated using Equations 40-1 through 40-9
L_{Ti}	Naphthalene Losses (lb/month)	0.028	0.023	0.036	0.053	0.052	0.081	0.090	0.097	0.075	0.059	0.037	0.026	0.657	Calculated using Equations 40-1 through 40-9
L_{Ti}	Toluene Losses (lb/month)	0.74	0.62	0.90	1.18	1.17	1.63	1.75	1.85	1.52	1.32	0.93	0.70	14.32	Calculated using Equations 40-1 through 40-9
L_{Ti}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.141	0.115	0.176	0.249	0.247	0.369	0.402	0.432	0.342	0.279	0.184	0.131	3.067	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	0.22	0.18	0.27	0.37	0.36	0.52	0.56	0.60	0.49	0.41	0.28	0.20	4.46	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (o) Losses (lb/month)	0.18	0.14	0.21	0.29	0.29	0.42	0.46	0.49	0.39	0.33	0.22	0.16	3.59	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (p) Losses (lb/month)	0.236	0.196	0.289	0.392	0.389	0.555	0.601	0.638	0.518	0.439	0.301	0.221	4.773	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-699 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.33954**	**0.30814**	**0.38627**	**0.51637**	**0.50962**	**0.68921**	**0.72221**	**0.78358**	**0.66513**	**0.52049**	**0.39988**	**0.33125**	**0.78358**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00409	0.00370	0.00469	0.00637	0.00628	0.00864	0.00907	0.00989	0.00832	0.00642	0.00486	0.00399		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218	26,218		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.340**	**0.308**	**0.386**	**0.516**	**0.510**	**0.689**	**0.722**	**0.784**	**0.665**	**0.520**	**0.400**	**0.331**	**0.784**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.340	0.308	0.386	0.516	0.510	0.689	0.722	0.784	0.665	0.520	0.400	0.331	0.784	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.042	0.038	0.047	0.060	0.059	0.076	0.079	0.085	0.074	0.060	0.048	0.041	0.085	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.013	0.012	0.014	0.018	0.018	0.022	0.023	0.024	0.021	0.018	0.015	0.013	0.024	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.009	0.009	0.010	0.013	0.012	0.015	0.016	0.017	0.015	0.013	0.010	0.009	0.017	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.004	0.003	0.002	0.002	0.005	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00130	0.00118	0.00148	0.00199	0.00197	0.00266	0.00279	0.00302	0.00257	0.00201	0.00154	0.00127	0.00302	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.03	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.003	0.002	0.003	0.004	0.004	0.005	0.006	0.006	0.005	0.004	0.003	0.002	0.006	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.004	0.004	0.005	0.006	0.006	0.008	0.009	0.009	0.008	0.006	0.005	0.004	0.009	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -700 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	26.00	Tank Volume (bbl):	2,364.06
Net Throughput (bbl/yr):	10,476	Turnovers Per Year:	4.62
Maximum Pumping Rate (bbl/hr):	959.975		
Shell Height (ft):	30	Maximum Liquid Height (ft):	25
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.81
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.10**	**48.56**	**55.64**	**51.78**	**0.0041**	**0.00356**	**0.00467**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.86%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.75%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.95%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**49.42**	**45.84**	**53.00**	**49.00**	**0.0037**	**0.00321**	**0.00423**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00003	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.96%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.83%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.14%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.01%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**55.63**	**50.98**	**60.28**	**54.98**	**0.0047**	**0.00391**	**0.00556**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00025	0.00033	78.11	78.11	0.01%	3.74%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.65%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.86%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**63.84**	**58.09**	**69.59**	**62.87**	**0.0063**	**0.00512**	**0.00780**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00043	78.11	78.11	0.01%	3.46%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**63.44**	**58.18**	**68.70**	**62.40**	**0.0062**	**0.00514**	**0.00755**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-700 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00006	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00042	78.11	78.11	0.01%	3.47%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.45%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.68%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**72.26**	**65.07**	**79.45**	**70.94**	**0.0086**	**0.00663**	**0.01103**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.20%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0004	84.16	84.16	0.01%	2.25%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**73.66**	**66.36**	**80.96**	**72.37**	**0.0090**	**0.00694**	**0.01161**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00057	78.11	78.11	0.01%	3.16%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.22%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0005	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**76.14**	**69.06**	**83.22**	**75.01**	**0.0098**	**0.00765**	**0.01254**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00011	120.19	120.19	0.14%	0.797658%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00042	0.00060	78.11	78.11	0.01%	3.088217%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000407%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.165320%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.585916%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385821%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.179517%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.412854%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.106259%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.898254%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.178578%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**71.26**	**64.64**	**77.88**	**70.36**	**0.0083**	**0.00652**	**0.01044**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00005	0.00009	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00037	0.00053	78.11	78.11	0.01%	3.23%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0002	0.0003	84.16	84.16	0.01%	2.27%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.51%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**64.11**	**57.06**	**71.16**	**63.43**	**0.0064**	**0.00493**	**0.00825**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.77%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00030	0.00044	78.11	78.11	0.01%	3.45%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.44%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.67%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.22%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**56.64**	**51.30**	**61.98**	**56.23**	**0.0049**	**0.00396**	**0.00592**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00035	78.11	78.11	0.01%	3.70%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.44**	**48.50**	**54.38**	**51.20**	**0.0040**	**0.00356**	**0.00446**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.89%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-700 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.77%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.96%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-700 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.7823**	**0.6504**	**1.1574**	**1.8158**	**1.6946**	**2.9758**	**3.2629**	**3.4192**	**2.6559**	**2.3223**	**1.3304**	**0.6349**	**22.7020**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0278	0.0282	0.0362	0.0441	0.0404	0.0544	0.0551	0.0532	0.0501	0.0540	0.0415	0.0231		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9962	0.9965	0.9956	0.9941	0.9942	0.9920	0.9916	0.9908	0.9923	0.9940	0.9955	0.9963		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96	9,434.96		Calculated Using Equation 1-3
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771	17.771		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.77	509.09	515.30	523.51	523.11	531.93	533.33	535.81	530.93	523.78	516.31	511.11		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.08	509.52	515.94	524.47	524.15	533.24	534.62	536.95	531.83	524.46	516.72	511.35		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0278**	**0.0282**	**0.0362**	**0.0441**	**0.0404**	**0.0544**	**0.0551**	**0.0532**	**0.0501**	**0.0540**	**0.0415**	**0.0231**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.18	14.32	18.61	22.99	21.04	28.77	29.22	28.33	26.48	28.19	21.36	11.77		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0032	0.0039	0.0051	0.0051	0.0066	0.0069	0.0077	0.0065	0.0049	0.0040	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0042	0.0056	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0082	0.0059	0.0045		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.77	509.09	515.30	523.51	523.11	531.93	533.33	535.81	530.93	523.78	516.31	511.11		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.23	505.51	510.65	517.76	517.85	524.74	526.03	528.73	524.31	516.73	510.97	508.17		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.31	512.67	519.95	529.26	528.37	539.12	540.63	542.89	537.55	530.83	521.65	514.05		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9962**	**0.9965**	**0.9956**	**0.9941**	**0.9942**	**0.9920**	**0.9916**	**0.9908**	**0.9923**	**0.9940**	**0.9955**	**0.9963**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707	17.7707		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.4827**	**0.3953**	**0.5479**	**0.7074**	**0.7208**	**0.9419**	**1.0200**	**1.1078**	**0.9115**	**0.7383**	**0.5499**	**0.4714**	**8.5948**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0063	0.0062	0.0086	0.0090	0.0098	0.0083	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	37,369	33,753	37,369	36,164	37,369	36,164	37,369	37,369	36,164	37,369	36,164	37,369		Specified monthly throughput
N	Annual Turnovers	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**1.265**	**1.046**	**1.705**	**2.523**	**2.415**	**3.918**	**4.283**	**4.527**	**3.567**	**3.061**	**1.880**	**1.106**	**31.297**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	1.265	1.046	1.705	2.523	2.415	3.918	4.283	4.527	3.567	3.061	1.880	1.106	31.297	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.156	0.130	0.206	0.292	0.280	0.433	0.470	0.491	0.397	0.353	0.226	0.137	3.569	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.049	0.041	0.064	0.087	0.084	0.125	0.135	0.140	0.115	0.106	0.070	0.043	1.059	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	0.035	0.030	0.045	0.062	0.059	0.088	0.095	0.098	0.081	0.075	0.049	0.031	0.747	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.008	0.007	0.010	0.015	0.015	0.023	0.025	0.027	0.021	0.018	0.012	0.007	0.188	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0048	0.0040	0.0066	0.0097	0.0093	0.0151	0.0165	0.0175	0.0138	0.0118	0.0072	0.0042	0.1206	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.002	0.002	0.003	0.004	0.004	0.007	0.008	0.008	0.006	0.005	0.003	0.002	0.052	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	0.05	0.04	0.07	0.09	0.09	0.14	0.15	0.15	0.13	0.11	0.07	0.04	1.13	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.009	0.008	0.013	0.020	0.019	0.031	0.034	0.036	0.028	0.024	0.014	0.008	0.244	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.02	0.01	0.35	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.01	0.01	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.28	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.016	0.013	0.021	0.031	0.029	0.047	0.051	0.053	0.043	0.037	0.023	0.014	0.378	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-700 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.52121**	**0.47266**	**0.59190**	**0.79024**	**0.77936**	**1.05281**	**1.10325**	**1.19787**	**1.01805**	**0.79767**	**0.61363**	**0.50886**	**1.19787**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00409	0.00369	0.00467	0.00634	0.00624	0.00858	0.00901	0.00983	0.00828	0.00640	0.00485	0.00398		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319	40,319		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.521**	**0.473**	**0.592**	**0.790**	**0.779**	**1.053**	**1.103**	**1.198**	**1.018**	**0.798**	**0.614**	**0.509**	**1.198**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.521	0.473	0.592	0.790	0.779	1.053	1.103	1.198	1.018	0.798	0.614	0.509	1.198	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.064	0.059	0.071	0.091	0.090	0.116	0.121	0.130	0.113	0.092	0.074	0.063	0.130	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.020	0.019	0.022	0.027	0.027	0.034	0.035	0.037	0.033	0.028	0.023	0.020	0.037	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.014	0.013	0.016	0.019	0.019	0.024	0.024	0.026	0.023	0.019	0.016	0.014	0.026	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007	0.006	0.005	0.004	0.003	0.007	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00200	0.00181	0.00227	0.00305	0.00301	0.00406	0.00426	0.00462	0.00393	0.00308	0.00236	0.00195	0.00462	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.04	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.004	0.003	0.004	0.006	0.006	0.008	0.009	0.010	0.008	0.006	0.005	0.004	0.010	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.007	0.006	0.007	0.010	0.009	0.013	0.013	0.014	0.012	0.010	0.008	0.006	0.014	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -846 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	24.00	Tank Volume (bbl):	3,000.00
Net Throughput (bbl/yr):	13,365,257	Turnovers Per Year:	5,622.32
Maximum Pumping Rate (bbl/hr):	1,994.583		
Shell Height (ft):	32	Maximum Liquid Height (ft):	30.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{v_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Phenol Skim (Wastewater)**	**January**	**52.08**	**48.49**	**55.67**	**51.78**	**0.1885**	**0.16489**	**0.21502**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00120	78.11	78.11	0.50%	2.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1874	0.1639	0.2138	18.0153	18.0153	98.00%	97.39%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**February**	**49.41**	**45.79**	**53.03**	**49.00**	**0.1707**	**0.14889**	**0.19521**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0010	0.00090	0.00111	78.11	78.11	0.50%	2.48%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1696	0.1479	0.1940	18.0153	18.0153	98.00%	97.33%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**March**	**55.60**	**50.90**	**60.30**	**54.98**	**0.2145**	**0.18043**	**0.25400**	**18.00**	**18.38**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00104	0.00136	78.11	78.11	0.50%	2.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2132	0.1793	0.2526	18.0153	18.0153	98.00%	97.45%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**April**	**63.80**	**58.00**	**69.60**	**62.87**	**0.2875**	**0.23396**	**0.35133**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00175	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2859	0.2326	0.3495	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**May**	**63.40**	**58.11**	**68.69**	**62.40**	**0.2834**	**0.23481**	**0.34066**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00171	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2819	0.2335	0.3388	18.0153	18.0153	98.00%	97.59%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**June**	**72.21**	**64.96**	**79.46**	**70.94**	**0.3840**	**0.29939**	**0.48874**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00155	0.00226	78.11	78.11	0.50%	2.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3820	0.2977	0.4863	18.0153	18.0153	98.00%	97.73%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**July**	**73.61**	**66.25**	**80.97**	**72.37**	**0.4026**	**0.31309**	**0.51351**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00160	0.00235	78.11	78.11	0.50%	2.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4005	0.3114	0.5110	18.0153	18.0153	98.00%	97.76%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**August**	**76.10**	**68.96**	**83.24**	**75.01**	**0.4375**	**0.34373**	**0.55276**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0021	0.00172	0.00249	78.11	78.11	0.50%	2.020783%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.004425%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.007255%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.174863%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4353	0.3419	0.5501	18.0153	18.0153	98.00%	97.792673%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-846 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Mixture/Product	**Phenol Skim (Wastewater)**	**September**	**71.22**	**64.53**	**77.91**	**70.36**	**0.3713**	**0.29491**	**0.46448**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0018	0.00153	0.00217	78.11	78.11	0.50%	2.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3694	0.2933	0.4622	18.0153	18.0153	98.00%	97.72%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**October**	**64.08**	**56.95**	**71.21**	**63.43**	**0.2903**	**0.22519**	**0.37126**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00124	0.00183	78.11	78.11	0.50%	2.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2887	0.2239	0.3693	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**November**	**56.63**	**51.22**	**62.04**	**56.23**	**0.2226**	**0.18257**	**0.27021**	**18.00**	**18.37**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00105	0.00143	78.11	78.11	0.50%	2.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2213	0.1815	0.2687	18.0153	18.0153	98.00%	97.47%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**December**	**51.43**	**48.45**	**54.41**	**51.20**	**0.1840**	**0.16463**	**0.20537**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00115	78.11	78.11	0.50%	2.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1829	0.1636	0.2041	18.0153	18.0153	98.00%	97.37%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-846 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.0505**	**3.3891**	**5.9113**	**9.0061**	**8.4021**	**14.2829**	**15.5776**	**16.1750**	**12.8331**	**11.5602**	**6.8027**	**3.2963**	**111.2870**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0009	0.0009	0.0012	0.0013	0.0014	0.0012	0.0009	0.0007	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0315	0.0316	0.0416	0.0524	0.0478	0.0677	0.0692	0.0680	0.0622	0.0646	0.0480	0.0261		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8548	0.8667	0.8381	0.7943	0.7966	0.7430	0.7338	0.7173	0.7493	0.7927	0.8329	0.8578		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62	7,690.62		Calculated Using Equation 1-3
D	Tank Diameter (ft)	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000	17.000		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0009**	**0.0009**	**0.0012**	**0.0013**	**0.0014**	**0.0012**	**0.0009**	**0.0007**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.75	509.08	515.27	523.47	523.07	531.88	533.28	535.77	530.89	523.75	516.30	511.10		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.06	509.48	515.89	524.39	524.06	533.14	534.52	536.86	531.76	524.41	516.69	511.33		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0315**	**0.0316**	**0.0416**	**0.0524**	**0.0478**	**0.0677**	**0.0692**	**0.0680**	**0.0622**	**0.0646**	**0.0480**	**0.0261**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.36	14.48	18.80	23.18	21.18	28.99	29.44	28.57	26.75	28.54	21.65	11.93		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.05	0.07	0.12	0.11	0.19	0.20	0.21	0.17	0.15	0.09	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1649	0.1489	0.1804	0.2340	0.2348	0.2994	0.3131	0.3437	0.2949	0.2252	0.1826	0.1646		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2150	0.1952	0.2540	0.3513	0.3407	0.4887	0.5135	0.5528	0.4645	0.3713	0.2702	0.2054		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.75	509.08	515.27	523.47	523.07	531.88	533.28	535.77	530.89	523.75	516.30	511.10		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.16	505.46	510.57	517.67	517.78	524.63	525.92	528.63	524.20	516.62	510.89	508.12		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.34	512.70	519.97	529.27	528.36	539.13	540.64	542.91	537.58	530.88	521.71	514.08		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8548**	**0.8667**	**0.8381**	**0.7943**	**0.7966**	**0.7430**	**0.7338**	**0.7173**	**0.7493**	**0.7927**	**0.8329**	**0.8578**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000	17.0000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**691.3748**	**568.5325**	**780.3736**	**994.6536**	**1,014.1670**	**1,305.5433**	**1,410.3516**	**1,525.6183**	**1,265.9163**	**1,037.8762**	**782.6379**	**675.9682**	**12,053.0132**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1885	0.1707	0.2145	0.2875	0.2834	0.3840	0.4026	0.4375	0.3713	0.2903	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	47,675,518	43,061,758	47,675,518	46,137,598	47,675,518	46,137,598	47,675,518	47,675,518	46,137,598	47,675,518	46,137,598	47,675,518		Specified monthly throughput
N	Annual Turnovers	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32	5,622.32		Calculated Using Equation 1-36
K_N	Turnover Factor	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720	0.1720		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**695.425**	**571.922**	**786.285**	**1,003.660**	**1,022.569**	**1,319.826**	**1,425.929**	**1,541.793**	**1,278.749**	**1,049.436**	**789.441**	**679.265**	**12,164.300**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	18.184	15.255	20.035	24.111	24.635	29.910	32.008	34.032	29.175	25.161	19.965	17.848	290.320	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	18.166	15.241	20.012	24.077	24.600	29.855	31.948	33.964	29.124	25.125	19.942	17.830	289.884	Sum of HAP Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	677.2408	556.6661	766.2501	979.5485	997.9341	1,289.9166	1,393.9213	1,507.7609	1,249.5741	1,024.2753	769.4758	661.4168	11,873.9802	Sum of Non-Pollutant Component Emissions
L_{Ti}	Benzene Losses (lb/month)	16.905	14.205	18.585	22.252	22.741	27.453	29.352	31.156	26.796	23.217	18.508	16.598	267.767	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-o) Losses (lb/month)	0.018	0.014	0.023	0.035	0.035	0.054	0.060	0.068	0.051	0.036	0.023	0.018	0.436	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.03	0.03	0.04	0.06	0.06	0.09	0.10	0.11	0.09	0.06	0.04	0.03	0.74	Calculated using Equations 40-1 through 40-9
L_{Ti}	Water Losses (lb/month)	677.241	556.666	766.250	979.548	997.934	1,289.917	1,393.921	1,507.761	1,249.574	1,024.275	769.476	661.417	11,873.980	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.23	1.01	1.39	1.77	1.80	2.31	2.50	2.70	2.24	1.85	1.39	1.20	21.38	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-846 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**7.06792**	**6.43609**	**7.98258**	**10.51952**	**10.38134**	**13.81582**	**14.44290**	**15.61874**	**13.38666**	**10.61720**	**8.26887**	**6.90935**	**15.61874**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.18850	0.17068	0.21447	0.28745	0.28344	0.38400	0.40255	0.43748	0.37133	0.29029	0.22263	0.18401		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**7.068**	**6.436**	**7.983**	**10.520**	**10.381**	**13.816**	**14.443**	**15.619**	**13.387**	**10.617**	**8.269**	**6.909**	**15.619**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.185	0.172	0.203	0.253	0.250	0.313	0.324	0.345	0.305	0.255	0.209	0.182	0.345	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.185	0.172	0.203	0.252	0.250	0.313	0.324	0.344	0.305	0.254	0.209	0.181	0.344	Sum of HAP Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	6.88310	6.26441	7.77918	10.26680	10.13124	13.50273	14.11870	15.27398	13.08124	10.36265	8.05975	6.72781	15.27398	Sum of Non-Pollutant Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.172	0.160	0.189	0.233	0.231	0.287	0.297	0.316	0.281	0.235	0.194	0.169	0.316	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-o) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	6.883	6.264	7.779	10.267	10.131	13.503	14.119	15.274	13.081	10.363	8.060	6.728	15.274	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A -847 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	26.00	Tank Volume (bbl):	3,000.00
Net Throughput (bbl/yr):	13,365,257	Turnovers Per Year:	4,633.54
Maximum Pumping Rate (bbl/hr):	1,994.583		
Shell Height (ft):	32	Maximum Liquid Height (ft):	31.5
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.81
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L_i}	Z_{v_i}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Phenol Skim (Wastewater)**	**January**	**52.09**	**48.52**	**55.66**	**51.78**	**0.1886**	**0.16511**	**0.21490**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00119	78.11	78.11	0.50%	2.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1874	0.1641	0.2136	18.0153	18.0153	98.00%	97.39%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**February**	**49.42**	**45.82**	**53.02**	**49.00**	**0.1707**	**0.14908**	**0.19513**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0010	0.00090	0.00111	78.11	78.11	0.50%	2.48%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1697	0.1481	0.1940	18.0153	18.0153	98.00%	97.33%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**March**	**55.62**	**50.95**	**60.29**	**54.98**	**0.2146**	**0.18073**	**0.25395**	**18.00**	**18.38**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00104	0.00136	78.11	78.11	0.50%	2.36%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2134	0.1796	0.2525	18.0153	18.0153	98.00%	97.45%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**April**	**63.82**	**58.05**	**69.59**	**62.87**	**0.2877**	**0.23435**	**0.35126**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00175	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2861	0.2330	0.3494	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**May**	**63.42**	**58.14**	**68.70**	**62.40**	**0.2836**	**0.23514**	**0.34067**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00128	0.00171	78.11	78.11	0.50%	2.22%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2821	0.2338	0.3389	18.0153	18.0153	98.00%	97.59%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**June**	**72.24**	**65.02**	**79.46**	**70.94**	**0.3844**	**0.30001**	**0.48875**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00155	0.00226	78.11	78.11	0.50%	2.08%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3824	0.2984	0.4863	18.0153	18.0153	98.00%	97.73%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**July**	**73.64**	**66.31**	**80.97**	**72.37**	**0.4030**	**0.31376**	**0.51349**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0019	0.00160	0.00235	78.11	78.11	0.50%	2.06%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4009	0.3121	0.5110	18.0153	18.0153	98.00%	97.76%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**August**	**76.12**	**69.01**	**83.23**	**75.01**	**0.4378**	**0.34437**	**0.55251**	**18.00**	**18.33**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0021	0.00172	0.00249	78.11	78.11	0.50%	2.020485%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.004427%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.007257%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.50%	0.174861%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.4356	0.3425	0.5498	18.0153	18.0153	98.00%	97.792971%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-847 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Mixture/Product	**Phenol Skim (Wastewater)**	**September**	**71.24**	**64.59**	**77.89**	**70.36**	**0.3716**	**0.29550**	**0.46422**	**18.00**	**18.34**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0018	0.00153	0.00217	78.11	78.11	0.50%	2.10%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.3696	0.2939	0.4619	18.0153	18.0153	98.00%	97.72%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**October**	**64.10**	**57.01**	**71.19**	**63.43**	**0.2905**	**0.22574**	**0.37091**	**18.00**	**18.36**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0015	0.00124	0.00183	78.11	78.11	0.50%	2.21%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2889	0.2244	0.3690	18.0153	18.0153	98.00%	97.60%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**November**	**56.63**	**51.26**	**62.00**	**56.23**	**0.2226**	**0.18284**	**0.26983**	**18.00**	**18.37**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0012	0.00105	0.00143	78.11	78.11	0.50%	2.34%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.01%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.2213	0.1817	0.2683	18.0153	18.0153	98.00%	97.47%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	**Phenol Skim (Wastewater)**	**December**	**51.43**	**48.47**	**54.39**	**51.20**	**0.1840**	**0.16477**	**0.20521**	**18.00**	**18.39**	**--**	**--**	**Sum of partial pressures of individual components listed below.**
	Benzene						0.0011	0.00097	0.00115	78.11	78.11	0.50%	2.44%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-o)						0.0000	0.00000	0.00000	108.14	108.14	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1391.3, C = 160.18.
	Phenol						0.0000	0.0000	0.0000	94.11	94.11	0.50%	0.00%	Equation 1-26 (Antoine's equation). A = 7.12, B = 1509.7, C = 174.2.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.50%	0.18%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Water						0.1829	0.1637	0.2040	18.0153	18.0153	98.00%	97.37%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-847 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**4.6077**	**3.8576**	**6.7401**	**10.2902**	**9.6083**	**16.3547**	**17.8385**	**18.5163**	**14.6667**	**13.1803**	**7.7375**	**3.7472**	**127.1451**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0009	0.0009	0.0012	0.0013	0.0014	0.0012	0.0009	0.0007	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0313	0.0314	0.0413	0.0522	0.0476	0.0674	0.0689	0.0676	0.0619	0.0642	0.0476	0.0259		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8583	0.8699	0.8418	0.7988	0.8011	0.7482	0.7392	0.7229	0.7545	0.7972	0.8369	0.8612		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30	8,771.30		Calculated Using Equation 1-3
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521	16.521		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0009**	**0.0009**	**0.0012**	**0.0013**	**0.0014**	**0.0012**	**0.0009**	**0.0007**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.76	509.09	515.29	523.49	523.09	531.91	533.31	535.79	530.91	523.77	516.30	511.10		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.07	509.50	515.92	524.43	524.11	533.20	534.58	536.91	531.80	524.44	516.71	511.34		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0313**	**0.0314**	**0.0413**	**0.0522**	**0.0476**	**0.0674**	**0.0689**	**0.0676**	**0.0619**	**0.0642**	**0.0476**	**0.0259**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.26	14.39	18.70	23.08	21.10	28.87	29.32	28.44	26.60	28.35	21.49	11.84		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.05	0.07	0.12	0.11	0.19	0.20	0.21	0.17	0.15	0.09	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1651	0.1491	0.1807	0.2344	0.2351	0.3000	0.3138	0.3444	0.2955	0.2257	0.1828	0.1648		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2149	0.1951	0.2540	0.3513	0.3407	0.4888	0.5135	0.5525	0.4642	0.3709	0.2698	0.2052		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.76	509.09	515.29	523.49	523.09	531.91	533.31	535.79	530.91	523.77	516.30	511.10		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.19	505.49	510.62	517.72	517.81	524.69	525.98	528.68	524.26	516.68	510.93	508.14		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.33	512.69	519.96	529.26	528.37	539.13	540.64	542.90	537.56	530.86	521.67	514.06		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8583**	**0.8699**	**0.8418**	**0.7988**	**0.8011**	**0.7482**	**0.7392**	**0.7229**	**0.7545**	**0.7972**	**0.8369**	**0.8612**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207	16.5207		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**696.1895**	**572.4888**	**786.0651**	**1,001.8584**	**1,021.5081**	**1,315.3718**	**1,420.9636**	**1,536.5918**	**1,275.0631**	**1,045.4176**	**787.7918**	**680.4294**	**12,139.7390**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1886	0.1707	0.2146	0.2877	0.2836	0.3844	0.4030	0.4378	0.3716	0.2905	0.2226	0.1840		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	47,675,518	43,061,758	47,675,518	46,137,598	47,675,518	46,137,598	47,675,518	47,675,518	46,137,598	47,675,518	46,137,598	47,675,518		Specified monthly throughput
N	Annual Turnovers	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54	4,633.54		Calculated Using Equation 1-36
K_N	Turnover Factor	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**700.797**	**576.346**	**792.805**	**1,012.149**	**1,031.116**	**1,331.727**	**1,438.802**	**1,555.108**	**1,289.730**	**1,058.598**	**795.529**	**684.177**	**12,266.884**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	18.324	15.372	20.198	24.312	24.837	30.173	32.290	34.322	29.422	25.377	20.119	17.977	292.723	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	18.305	15.358	20.175	24.277	24.802	30.118	32.230	34.253	29.370	25.341	20.095	17.959	292.283	Sum of HAP Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	682.4736	560.9739	772.6072	987.8369	1,006.2789	1,301.5535	1,406.5117	1,520.7864	1,260.3080	1,033.2206	775.4105	666.1998	11,974.1609	Sum of Non-Pollutant Component Emissions
L_{Ti}	Benzene Losses (lb/month)	17.034	14.313	18.736	22.437	22.928	27.694	29.610	31.421	27.022	23.416	18.651	16.718	269.979	Calculated using Equations 40-1 through 40-9
L_{Ti}	Cresol (-o) Losses (lb/month)	0.019	0.014	0.023	0.035	0.035	0.055	0.061	0.069	0.052	0.037	0.023	0.018	0.440	Calculated using Equations 40-1 through 40-9
L_{Ti}	Phenol Losses (lb/month)	0.03	0.03	0.04	0.06	0.06	0.09	0.10	0.11	0.09	0.06	0.04	0.03	0.75	Calculated using Equations 40-1 through 40-9
L_{Ti}	Water Losses (lb/month)	682.474	560.974	772.607	987.837	1,006.279	1,301.553	1,406.512	1,520.786	1,260.308	1,033.221	775.411	666.200	11,974.161	Calculated using Equations 40-1 through 40-9
L_{Ti}	Xylene (m) Losses (lb/month)	1.24	1.02	1.40	1.78	1.81	2.33	2.52	2.72	2.26	1.86	1.40	1.21	21.56	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-847 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**7.07038**	**6.43836**	**7.98805**	**10.52647**	**10.38822**	**13.82900**	**14.45659**	**15.62848**	**13.39520**	**10.62422**	**8.26887**	**6.90935**	**15.62848**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.39	18.39	18.38	18.36	18.36	18.34	18.33	18.33	18.34	18.36	18.37	18.39		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.18857	0.17074	0.21462	0.28765	0.28364	0.38439	0.40296	0.43777	0.37158	0.29049	0.22263	0.18401		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773	83,773		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**7.070**	**6.438**	**7.988**	**10.526**	**10.388**	**13.829**	**14.457**	**15.628**	**13.395**	**10.624**	**8.269**	**6.909**	**15.628**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.185	0.172	0.204	0.253	0.250	0.313	0.324	0.345	0.306	0.255	0.209	0.182	0.345	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.185	0.172	0.203	0.252	0.250	0.313	0.324	0.344	0.305	0.254	0.209	0.181	0.344	Sum of HAP Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	6.88552	6.26664	7.78454	10.27363	10.13798	13.51567	14.13215	15.28356	13.08962	10.36953	8.05975	6.72781	15.28356	Sum of Non-Pollutant Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.172	0.160	0.189	0.233	0.231	0.288	0.298	0.316	0.281	0.235	0.194	0.169	0.316	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-o) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	Calculated using Equations 40-1 through 40-9
L_{TI}	Phenol Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	6.886	6.267	7.785	10.274	10.138	13.516	14.132	15.284	13.090	10.370	8.060	6.728	15.284	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.03	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP -42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	176.00	Tank Volume (bbl):	216,600.00
Net Throughput (bbl/yr):	50,000,000	Turnovers Per Year:	230.76
Maximum Pumping Rate (bbl/hr):	12,000.000		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Feedstock	January	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	February	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	March	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	April	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	May	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	June	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	July	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	August	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	September	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	October	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	November	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	December	140.00	--	--	140.00	0.0040	--	--	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.742**	**0.853**	**0.815**	**0.924**	**1.161**	**1.012**	**1.039**	**1.033**	**0.907**	**0.752**	**0.664**	**0.694**	**10.595**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.267**	**0.263**	**0.276**	**0.283**	**0.317**	**0.294**	**0.303**	**0.302**	**0.281**	**0.268**	**0.251**	**0.261**	**3.367**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	162.25	177.48	167.83	178.24	192.97	184.86	184.36	183.94	176.97	163.06	157.92	158.56		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**262.797**	**237.365**	**262.797**	**254.319**	**262.797**	**254.319**	**262.797**	**262.797**	**254.319**	**262.797**	**254.319**	**262.797**	**3,094.219**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	4,246,575	3,835,616	4,246,575	4,109,589	4,246,575	4,109,589	4,246,575	4,246,575	4,109,589	4,246,575	4,109,589	4,246,575		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70		From Chemical Properties Database
D	Tank Diameter (ft)	176	176	176	176	176	176	176	176	176	176	176	176		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**263.805**	**238.481**	**263.887**	**255.527**	**264.274**	**255.626**	**264.139**	**264.132**	**255.508**	**263.817**	**255.235**	**263.751**	**3,108.181**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	263.805	238.481	263.887	255.527	264.274	255.626	264.139	264.132	255.508	263.817	255.235	263.751	3,108.181	Sum of VOC Component Emissions

Date printed: 1/25/2022

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-867 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.744**	**0.744**	**0.744**	**0.744**	**0.745**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.745**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	**0.743**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71	285.71		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00	176.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.001**	**0.001**	**0.001**	**0.001**	**0.002**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.002**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.744**	**0.744**	**0.744**	**0.744**	**0.745**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.744**	**0.745**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	0.744	0.744	0.744	0.744	0.745	0.744	0.744	0.744	0.744	0.744	0.744	0.744	0.745	Sum of VOC Component Emissions

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Gasketed Sliding Cover, w. Sleeve	8.6	12	0.81	1
Automatic Gauge Float Well, Bolted Cover, Gasketed	2.8	-	-	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	3
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	28
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	56
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-868 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	134.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	115.39
Maximum Pumping Rate (bbl/hr):	3,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-868 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.61**	**--**	**--**	**52.35**	**0.0042**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**50.11**	**--**	**--**	**49.76**	**0.0038**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**56.68**	**--**	**--**	**56.14**	**0.0049**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**65.40**	**--**	**--**	**64.61**	**0.0067**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**65.13**	**--**	**--**	**64.27**	**0.0066**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**74.40**	**--**	**--**	**73.31**	**0.0092**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**75.76**	**--**	**--**	**74.69**	**0.0097**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**77.99**	**--**	**--**	**77.05**	**0.0105**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.259931%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**72.72**	**--**	**--**	**71.98**	**0.0087**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**65.22**	**--**	**--**	**64.66**	**0.0067**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**57.31**	**--**	**--**	**56.97**	**0.0050**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.82**	**--**	**--**	**51.63**	**0.0040**	**--**	**--**	**188.00**	**130.00**	**--**	**--**	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-868 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.268**	**0.280**	**0.344**	**0.538**	**0.669**	**0.813**	**0.875**	**0.941**	**0.687**	**0.435**	**0.287**	**0.244**	**6.380**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0042	0.0038	0.0049	0.0067	0.0066	0.0092	0.0097	0.0105	0.0087	0.0067	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.133**	**0.132**	**0.166**	**0.253**	**0.317**	**0.382**	**0.411**	**0.442**	**0.324**	**0.214**	**0.145**	**0.123**	**3.042**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	169.74	206.23	181.95	208.33	254.44	227.70	226.17	224.90	204.85	171.42	161.11	162.34		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**59.171**	**53.445**	**59.171**	**57.263**	**59.171**	**57.263**	**59.171**	**59.171**	**57.263**	**59.171**	**57.263**	**59.171**	**696.694**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	849,315	767,123	849,315	821,918	849,315	821,918	849,315	849,315	821,918	849,315	821,918	849,315		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	134	134	134	134	134	134	134	134	134	134	134	134		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**59.572**	**53.857**	**59.681**	**58.054**	**60.157**	**58.457**	**60.458**	**60.554**	**58.273**	**59.820**	**57.695**	**59.538**	**706.116**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	59.572	53.857	59.681	58.054	60.157	58.457	60.458	60.554	58.273	59.820	57.695	59.538	706.116	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.064	0.059	0.066	0.067	0.072	0.072	0.075	0.077	0.070	0.067	0.063	0.064	0.815	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0642	0.0586	0.0656	0.0672	0.0716	0.0723	0.0754	0.0766	0.0700	0.0674	0.0627	0.0638	0.8153	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-868 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.210**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	**0.211**	**0.211**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.001**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.210**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	**0.211**	**0.211**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	Calculated Using Equation 2-1
L_{Ti}	Total VOC Losses (lb/hr)	0.210	0.210	0.210	0.210	0.210	0.211	0.211	0.211	0.210	0.210	0.210	0.210	0.211	Sum of VOC Component Emissions
L_{Ti}	Total HAP Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Sum of HAP Component Emissions
L_{Ti}	Isopropyl benzene Losses (lb/hr)	0.00022	0.00022	0.00022	0.00022	0.00023	0.00023	0.00023	0.00023	0.00023	0.00022	0.00022	0.00022	0.00023	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25	2.2	2.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	20
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable,	0.49	0.16	0.14	28
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-869 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	134.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	115.39
Maximum Pumping Rate (bbl/hr):	3,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-869 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.61**	--	--	**52.35**	**0.0042**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**50.11**	--	--	**49.76**	**0.0038**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**56.68**	--	--	**56.14**	**0.0049**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**65.40**	--	--	**64.61**	**0.0067**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**65.13**	--	--	**64.27**	**0.0066**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**74.40**	--	--	**73.31**	**0.0092**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**75.76**	--	--	**74.69**	**0.0097**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**77.99**	--	--	**77.05**	**0.0105**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.259931%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**72.72**	--	--	**71.98**	**0.0087**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**65.22**	--	--	**64.66**	**0.0067**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**57.31**	--	--	**56.97**	**0.0050**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.82**	--	--	**51.63**	**0.0040**	--	--	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-869 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**0.268**	**0.280**	**0.344**	**0.538**	**0.669**	**0.813**	**0.875**	**0.941**	**0.687**	**0.435**	**0.287**	**0.244**	**6.380**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
p*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0042	0.0038	0.0049	0.0067	0.0066	0.0092	0.0097	0.0105	0.0087	0.0067	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**0.133**	**0.132**	**0.166**	**0.253**	**0.317**	**0.382**	**0.411**	**0.442**	**0.324**	**0.214**	**0.145**	**0.123**	**3.042**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	169.74	206.23	181.95	208.33	254.44	227.70	226.17	224.90	204.85	171.42	161.11	162.34		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**59.171**	**53.445**	**59.171**	**57.263**	**59.171**	**57.263**	**59.171**	**59.171**	**57.263**	**59.171**	**57.263**	**59.171**	**696.694**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	849,315	767,123	849,315	821,918	849,315	821,918	849,315	849,315	821,918	849,315	821,918	849,315		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	134	134	134	134	134	134	134	134	134	134	134	134		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**59.572**	**53.857**	**59.681**	**58.054**	**60.157**	**58.457**	**60.458**	**60.554**	**58.273**	**59.820**	**57.695**	**59.538**	**706.116**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	59.572	53.857	59.681	58.054	60.157	58.457	60.458	60.554	58.273	59.820	57.695	59.538	706.116	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.064	0.059	0.066	0.067	0.072	0.072	0.075	0.077	0.070	0.067	0.063	0.064	0.815	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0642	0.0586	0.0656	0.0672	0.0716	0.0723	0.0754	0.0766	0.0700	0.0674	0.0627	0.0638	0.8153	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-869 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.210**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	**0.211**	**0.211**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	**0.209**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43	71.43		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00	134.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.001**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.001**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.210**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	**0.211**	**0.211**	**0.210**	**0.210**	**0.210**	**0.210**	**0.211**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.210	0.210	0.210	0.210	0.210	0.211	0.211	0.211	0.210	0.210	0.210	0.210	0.211	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00022	0.00022	0.00022	0.00022	0.00023	0.00023	0.00023	0.00023	0.00023	0.00022	0.00022	0.00022	0.00023	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	**K_{Fa} (lbmol/yr)**	**K_{Fb} (lbmol/yr-mph)**	**m**	**N_F**
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover, w. Sleeve	25	2.2	2.1	1
Automatic Gauge Float Well, Unbolted Cover, Gasketed	4.3	17	0.38	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	2
Roof Drain (3-in. Diameter), 90% Closed	1.8	0.14	1.1	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Sock	1.2	0.14	0.65	20
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable.	0.49	0.16	0.14	28
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-877 (Post-Project PTE)	S-1468
Location:	Martinez Refinery	
Type of Tank:	Vertical Fixed Roof Tank	

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	70.00	Tank Volume (bbl):	24,676.00
Net Throughput (bbl/yr):	116,800	Turnovers Per Year:	5.13
Maximum Pumping Rate (bbl/hr):	1,000.000		
Shell Height (ft):	36	Maximum Liquid Height (ft):	34.2
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	2.19
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.02	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{ii}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Spent Caustic**	**January**	**52.17**	**48.88**	**55.46**	**51.78**	**0.1915**	**0.1695**	**0.2160**	**18.00**	**18.53**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1899	0.1680	0.2142	18.0153	18.0153	99.00%	96.38%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0016	0.0015	0.0017	120	80	1.00%	3.62%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**February**	**49.52**	**46.17**	**52.87**	**49.00**	**0.1736**	**0.1530**	**0.1965**	**18.00**	**18.56**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1721	0.1516	0.1949	18.0153	18.0153	99.00%	96.24%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0015	0.0014	0.0016	120	80	1.00%	3.76%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**March**	**55.77**	**51.38**	**60.16**	**54.98**	**0.2185**	**0.1860**	**0.2558**	**18.00**	**18.51**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2167	0.1844	0.2539	18.0153	18.0153	99.00%	96.57%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0017	0.0016	0.0019	120	80	1.00%	3.43%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**April**	**64.05**	**58.57**	**69.53**	**62.87**	**0.2934**	**0.2417**	**0.3545**	**18.00**	**18.45**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2913	0.2398	0.3522	18.0153	18.0153	99.00%	96.94%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0023	120	80	1.00%	3.06%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**May**	**63.67**	**58.61**	**68.73**	**62.40**	**0.2895**	**0.2420**	**0.3450**	**18.00**	**18.46**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2875	0.2401	0.3427	18.0153	18.0153	99.00%	96.92%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0023	120	80	1.00%	3.08%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**June**	**72.55**	**65.66**	**79.44**	**70.94**	**0.3928**	**0.3103**	**0.4938**	**18.00**	**18.41**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.3904	0.3082	0.4910	18.0153	18.0153	99.00%	97.26%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0025	0.0021	0.0028	120	80	1.00%	2.74%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**July**	**73.95**	**66.97**	**80.93**	**72.37**	**0.4118**	**0.3247**	**0.5185**	**18.00**	**18.40**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.4092	0.3225	0.5155	18.0153	18.0153	99.00%	97.31%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0025	0.0022	0.0029	120	80	1.00%	2.69%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**August**	**76.40**	**69.67**	**83.13**	**75.01**	**0.4468**	**0.3563**	**0.5567**	**18.00**	**18.39**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.4441	0.3539	0.5537	18.0153	18.0153	99.00%	97.40%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0027	0.0023	0.0031	120	80	1.00%	2.60%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**September**	**71.46**	**65.22**	**77.70**	**70.36**	**0.3786**	**0.3056**	**0.4664**	**18.00**	**18.41**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.3762	0.3035	0.4637	18.0153	18.0153	99.00%	97.23%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0024	0.0021	0.0027	120	80	1.00%	2.77%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**October**	**64.26**	**57.71**	**70.81**	**63.43**	**0.2956**	**0.2343**	**0.3704**	**18.00**	**18.45**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2935	0.2325	0.3680	18.0153	18.0153	99.00%	96.95%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0021	0.0018	0.0024	120	80	1.00%	3.05%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**November**	**56.73**	**51.80**	**61.66**	**56.23**	**0.2262**	**0.1889**	**0.2697**	**18.00**	**18.50**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.2244	0.1873	0.2678	18.0153	18.0153	99.00%	96.61%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0018	0.0016	0.0020	120	80	1.00%	3.39%	Equation 1-25. A = 11.36 and B = 5784.3.
Mixture/Product	**Spent Caustic**	**December**	**51.49**	**48.77**	**54.21**	**51.20**	**0.1868**	**0.1688**	**0.2064**	**18.00**	**18.54**	--	--	**Sum of partial pressures of individual components listed below.**
	Water						0.1852	0.1673	0.2047	18.0153	18.0153	99.00%	96.35%	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
	Jet Naphtha						0.0016	0.0015	0.0017	120	80	1.00%	3.65%	Equation 1-25. A = 11.36 and B = 5784.3.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-877 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**32.07**	**27.32**	**49.34**	**77.07**	**72.38**	**124.04**	**134.88**	**138.36**	**108.58**	**97.11**	**55.78**	**25.27**	**942.19**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0010	0.0009	0.0013	0.0013	0.0014	0.0012	0.0010	0.0008	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0254	0.0259	0.0354	0.0462	0.0424	0.0611	0.0624	0.0608	0.0547	0.0560	0.0403	0.0204		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8339	0.8470	0.8148	0.7661	0.7685	0.7099	0.7001	0.6827	0.7174	0.7648	0.8095	0.8373		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53	75,542.53		Calculated Using Equation 1-3
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629	19.629		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**	**0.73**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0010**	**0.0009**	**0.0013**	**0.0013**	**0.0014**	**0.0012**	**0.0010**	**0.0008**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.44	523.72	523.34	532.22	533.62	536.07	531.13	523.93	516.40	511.16		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.22	509.71	516.23	524.90	524.61	533.83	535.20	537.46	532.23	524.77	516.90	511.45		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0254**	**0.0259**	**0.0354**	**0.0462**	**0.0424**	**0.0611**	**0.0624**	**0.0608**	**0.0547**	**0.0560**	**0.0403**	**0.0204**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.14	13.41	17.56	21.90	20.25	27.56	27.92	26.92	24.96	26.21	19.72	10.88		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.04	0.07	0.11	0.10	0.18	0.19	0.20	0.16	0.14	0.08	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1695	0.1530	0.1860	0.2417	0.2420	0.3103	0.3247	0.3563	0.3056	0.2343	0.1889	0.1688		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2160	0.1965	0.2558	0.3545	0.3450	0.4938	0.5185	0.5567	0.4664	0.3704	0.2697	0.2064		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.44	523.72	523.34	532.22	533.62	536.07	531.13	523.93	516.40	511.16		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.55	505.84	511.05	518.24	518.28	525.33	526.64	529.34	524.89	517.38	511.47	508.44		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.13	512.54	519.83	529.20	528.40	539.11	540.60	542.80	537.37	530.48	521.33	513.88		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8339**	**0.8470**	**0.8148**	**0.7661**	**0.7685**	**0.7099**	**0.7001**	**0.6827**	**0.7174**	**0.7648**	**0.8095**	**0.8373**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293	19.6293		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**35.96**	**29.62**	**40.65**	**51.80**	**52.86**	**68.02**	**73.46**	**79.32**	**65.78**	**53.93**	**40.66**	**35.13**	**627.19**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1915	0.1736	0.2185	0.2934	0.2895	0.3928	0.4118	0.4468	0.3786	0.2956	0.2262	0.1868		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	416,640	376,320	416,640	403,200	416,640	403,200	416,640	416,640	403,200	416,640	403,200	416,640		Specified monthly throughput
N	Annual Turnovers	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20	34.20		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**68.03**	**56.94**	**89.98**	**128.87**	**125.23**	**192.07**	**208.33**	**217.68**	**174.36**	**151.04**	**96.44**	**60.41**	**1,569.38**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	2.46	2.14	3.09	3.95	3.86	5.25	5.60	5.67	4.84	4.61	3.27	2.21	46.93	Sum of VOC Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	65.58	54.80	86.89	124.92	121.38	186.81	202.74	212.01	169.52	146.43	93.17	58.20	1,522.45	Sum of Non-Pollutant Component Emissions
L_{TJ}	Jet Naphtha Losses (lb/month)	2.46	2.14	3.09	3.95	3.86	5.25	5.60	5.67	4.84	4.61	3.27	2.21	46.93	Calculated using Equations 40-1 through 40-9
L_{TJ}	Water Losses (lb/month)	65.58	54.80	86.89	124.92	121.38	186.81	202.74	212.01	169.52	146.43	93.17	58.20	1,522.45	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-877 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.63**	**3.31**	**4.10**	**5.41**	**5.34**	**7.11**	**7.43**	**8.02**	**6.87**	**5.45**	**4.24**	**3.54**	**8.02**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.53	18.56	18.51	18.45	18.46	18.41	18.40	18.39	18.41	18.45	18.50	18.54		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.19	0.17	0.22	0.29	0.29	0.39	0.41	0.45	0.38	0.30	0.23	0.19		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.63**	**3.31**	**4.10**	**5.41**	**5.34**	**7.11**	**7.43**	**8.02**	**6.87**	**5.45**	**4.24**	**3.54**	**8.02**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.13	0.12	0.14	0.17	0.16	0.19	0.20	0.21	0.19	0.17	0.14	0.13	0.21	Sum of VOC Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	3.50	3.19	3.96	5.24	5.18	6.91	7.23	7.81	6.68	5.28	4.10	3.41	7.81	Sum of Non-Pollutant Component Emissions
L_{TI}	Jet Naphtha Losses (lb/hr)	0.13	0.12	0.14	0.17	0.16	0.19	0.20	0.21	0.19	0.17	0.14	0.13	0.21	Calculated using Equations 40-1 through 40-9
L_{TI}	Water Losses (lb/hr)	3.50	3.19	3.96	5.24	5.18	6.91	7.23	7.81	6.68	5.28	4.10	3.41	7.81	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-895 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	70,167.00
Net Throughput (bbl/yr):	5,803,500	Turnovers Per Year:	65.77
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	47.8	Maximum Liquid Height (ft):	44.8
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	3.75
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[(1)]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Feedstock	January	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	February	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	March	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	April	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	May	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	June	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	July	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	August	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	September	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	October	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	November	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	December	140.00	140.00	140.00	140.00	0.0040	0.0040	0.0040	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-895 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944	0.9944		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41	301,404.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650	26.650		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40	22.40		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Fully insulated tanks assumed equal to T_{LA}
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**	**0.9944**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500	26.6500		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**305.31**	**275.76**	**305.31**	**295.46**	**305.31**	**295.46**	**305.31**	**305.31**	**295.46**	**305.31**	**295.46**	**305.31**	**3,594.79**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	20,701,800	18,698,400	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800	20,701,800	20,034,000	20,701,800	20,034,000	20,701,800		Specified monthly throughput
N	Annual Turnovers	65.77	65.77	65.77	65.77	65.77	65.77	65.77	65.77	65.77	65.77	65.77	65.77		Calculated Using Equation 1-36
K_N	Turnover Factor	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228	0.6228		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80	44.80		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**305.31**	**275.76**	**305.31**	**295.46**	**305.31**	**295.46**	**305.31**	**305.31**	**295.46**	**305.31**	**295.46**	**305.31**	**3,594.79**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	305.31	275.76	305.31	295.46	305.31	295.46	305.31	305.31	295.46	305.31	295.46	305.31	3,594.79	Sum of VOC Component Emissions

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-895 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	TCEQ APDG 6250 - Equation 1
M_v	Vapor Molecular Weight (lb/lb-mole)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	**5.97**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	Sum of VOC Component Emissions

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-905 (Post-Project PTE)	S-2007	
Location:	Martinez Refinery		
Type of Tank:	Vertical Fixed Roof Tank		

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	130.00	Tank Volume (bbl):	100,000.00
Net Throughput (bbl/yr):	8,705,250	Turnovers Per Year:	80.04
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	47
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.83
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{LI}	Z_{VI}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.19**	**49.00**	**55.38**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**49.55**	**46.28**	**52.82**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**55.83**	**51.54**	**60.12**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**64.13**	**58.75**	**69.51**	**62.87**	**0.0064**	**0.0053**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**63.76**	**58.77**	**68.75**	**62.40**	**0.0063**	**0.0053**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**72.66**	**65.88**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**74.06**	**67.20**	**80.92**	**72.37**	**0.0091**	**0.0072**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**76.49**	**69.89**	**83.09**	**75.01**	**0.0100**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**71.54**	**65.44**	**77.64**	**70.36**	**0.0084**	**0.0067**	**0.0104**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**64.32**	**57.95**	**70.69**	**63.43**	**0.0064**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**56.77**	**51.99**	**61.55**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.51**	**48.87**	**54.15**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-905 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**24.79**	**20.98**	**38.25**	**61.46**	**58.08**	**102.32**	**111.88**	**115.96**	**88.73**	**76.16**	**42.73**	**19.79**	**761.12**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0236	0.0244	0.0320	0.0399	0.0369	0.0498	0.0504	0.0482	0.0448	0.0475	0.0358	0.0193		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9943	0.9948	0.9934	0.9911	0.9912	0.9880	0.9874	0.9862	0.9884	0.9910	0.9932	0.9944		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41	350,988.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443	26.443		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.50	523.80	523.43	532.33	533.73	536.16	531.21	523.99	516.44	511.18		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.27	509.78	516.34	525.06	524.79	534.05	535.42	537.65	532.38	524.89	516.97	511.49		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0236**	**0.0244**	**0.0320**	**0.0399**	**0.0369**	**0.0498**	**0.0504**	**0.0482**	**0.0448**	**0.0475**	**0.0358**	**0.0193**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.76	13.08	17.17	21.50	19.96	27.11	27.44	26.40	24.40	25.47	19.11	10.55		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0068	0.0072	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.50	523.80	523.43	532.33	533.73	536.16	531.21	523.99	516.44	511.18		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.67	505.95	511.21	518.42	518.44	525.55	526.87	529.56	525.11	517.62	511.66	508.54		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.05	512.49	519.79	529.18	528.42	539.11	540.59	542.76	537.31	530.36	521.22	513.82		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9943**	**0.9948**	**0.9934**	**0.9911**	**0.9912**	**0.9880**	**0.9874**	**0.9862**	**0.9884**	**0.9910**	**0.9932**	**0.9944**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433	26.4433		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**217.87**	**178.67**	**248.18**	**321.33**	**327.75**	**429.18**	**464.74**	**503.89**	**413.78**	**334.46**	**248.51**	**212.59**	**3,900.96**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	31,052,700	28,047,600	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700		Specified monthly throughput
N	Annual Turnovers	80.04	80.04	80.04	80.04	80.04	80.04	80.04	80.04	80.04	80.04	80.04	80.04		Calculated Using Equation 1-36
K_N	Turnover Factor	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415	0.5415		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**242.65**	**199.65**	**286.43**	**382.79**	**385.84**	**531.50**	**576.61**	**619.85**	**502.52**	**410.62**	**291.24**	**232.38**	**4,662.09**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	242.65	199.65	286.43	382.79	385.84	531.50	576.61	619.85	502.52	410.62	291.24	232.38	4,662.09	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	3.04	2.49	3.60	4.82	4.86	6.70	7.27	7.81	6.34	5.17	3.66	2.91	58.68	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	3.04	2.49	3.60	4.82	4.86	6.70	7.27	7.81	6.34	5.17	3.66	2.91	58.68	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-905 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.27**	**2.97**	**3.73**	**4.99**	**4.93**	**6.67**	**6.99**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.27**	**2.97**	**3.73**	**4.99**	**4.93**	**6.67**	**6.99**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.27	2.97	3.73	4.99	4.93	6.67	6.99	7.57	6.42	5.02	3.85	3.19	7.57	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.10	0.08	0.06	0.05	0.04	0.10	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.10	0.08	0.06	0.05	0.04	0.10	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-932 (Post-Project PTE)	S-2028
Location:	Martinez Refinery	
Type of Tank:	Vertical Fixed Roof Tank	

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	120.00	Tank Volume (bbl):	86,100.00
Net Throughput (bbl/yr):	8,705,250	Turnovers Per Year:	129.38
Maximum Pumping Rate (bbl/hr):	6,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	34.4
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.00
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{L}	Z_{V}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.19**	**48.98**	**55.40**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**49.55**	**46.26**	**52.84**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**55.81**	**51.50**	**60.12**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**64.11**	**58.71**	**69.51**	**62.87**	**0.0064**	**0.0052**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**63.74**	**58.73**	**68.75**	**62.40**	**0.0063**	**0.0052**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**72.64**	**65.84**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**74.03**	**67.14**	**80.92**	**72.37**	**0.0091**	**0.0071**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**76.47**	**69.84**	**83.10**	**75.01**	**0.0099**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**71.52**	**65.39**	**77.65**	**70.36**	**0.0084**	**0.0067**	**0.0104**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**64.31**	**57.90**	**70.72**	**63.43**	**0.0064**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**56.76**	**51.95**	**61.57**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.51**	**48.85**	**54.17**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-932 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**19.85**	**16.79**	**30.56**	**49.07**	**46.33**	**81.67**	**89.29**	**92.63**	**70.93**	**60.97**	**34.23**	**15.86**	**608.17**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0238	0.0245	0.0322	0.0400	0.0371	0.0500	0.0506	0.0484	0.0451	0.0478	0.0360	0.0195		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9947	0.9952	0.9939	0.9917	0.9918	0.9888	0.9882	0.9872	0.9892	0.9916	0.9937	0.9948		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41	278,973.41		Calculated Using Equation 1-3
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667	24.667		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67		Calculated Using Equation 1-17 or 1-19
H_{RD}	**Roof Outage - Cone Roof (ft)**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**	**1.67**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0099	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.48	523.78	523.41	532.31	533.70	536.14	531.19	523.98	516.43	511.18		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.26	509.76	516.31	525.03	524.75	534.00	535.37	537.61	532.35	524.86	516.96	511.48		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0238**	**0.0245**	**0.0322**	**0.0400**	**0.0371**	**0.0500**	**0.0506**	**0.0484**	**0.0451**	**0.0478**	**0.0360**	**0.0195**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.85	13.15	17.26	21.60	20.03	27.21	27.56	26.52	24.53	25.64	19.25	10.63		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0099	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0052	0.0052	0.0068	0.0071	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0104	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.86	509.22	515.48	523.78	523.41	532.31	533.70	536.14	531.19	523.98	516.43	511.18		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.65	505.93	511.17	518.38	518.40	525.51	526.81	529.51	525.06	517.57	511.62	508.52		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.07	512.51	519.79	529.18	528.42	539.11	540.59	542.77	537.32	530.39	521.24	513.84		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9947**	**0.9952**	**0.9939**	**0.9917**	**0.9918**	**0.9888**	**0.9882**	**0.9872**	**0.9892**	**0.9916**	**0.9937**	**0.9948**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0099	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667	24.6667		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**160.37**	**131.51**	**182.54**	**236.36**	**241.09**	**315.71**	**341.74**	**370.66**	**304.37**	**246.10**	**182.85**	**156.48**	**2,869.79**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0099	0.0084	0.0064	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	31,052,700	28,047,600	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700		Specified monthly throughput
N	Annual Turnovers	129.38	129.38	129.38	129.38	129.38	129.38	129.38	129.38	129.38	129.38	129.38	129.38		Calculated Using Equation 1-36
K_N	Turnover Factor	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985	0.3985		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40	34.40		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**180.22**	**148.30**	**213.10**	**285.43**	**287.41**	**397.38**	**431.03**	**463.30**	**375.30**	**307.07**	**217.08**	**172.34**	**3,477.95**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	180.22	148.30	213.10	285.43	287.41	397.38	431.03	463.30	375.30	307.07	217.08	172.34	3,477.95	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	2.26	1.85	2.68	3.60	3.62	5.01	5.43	5.84	4.73	3.87	2.73	2.16	43.77	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	2.26	1.85	2.68	3.60	3.62	5.01	5.43	5.84	4.73	3.87	2.73	2.16	43.77	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-932 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**3.27**	**2.97**	**3.72**	**4.99**	**4.92**	**6.66**	**6.98**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000	252,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**3.27**	**2.97**	**3.72**	**4.99**	**4.92**	**6.66**	**6.98**	**7.57**	**6.42**	**5.02**	**3.85**	**3.19**	**7.57**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	3.27	2.97	3.72	4.99	4.92	6.66	6.98	7.57	6.42	5.02	3.85	3.19	7.57	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.10	0.08	0.06	0.05	0.04	0.10	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.10	0.08	0.06	0.05	0.04	0.10	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-933 (Post-Project PTE)	S-2008
Location:	Martinez Refinery	
Type of Tank:	Vertical Fixed Roof Tank	

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	140.00	Tank Volume (bbl):	117,000.00
Net Throughput (bbl/yr):	8,705,250	Turnovers Per Year:	68.13
Maximum Pumping Rate (bbl/hr):	9,330.750		
Shell Height (ft):	48	Maximum Liquid Height (ft):	47.6
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	5.83
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.01	Pressure Settings (psig):	0.01

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{LI}	Z_{VI}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.20**	**49.03**	**55.37**	**51.78**	**0.0041**	**0.0036**	**0.0046**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**49.56**	**46.31**	**52.81**	**49.00**	**0.0037**	**0.0033**	**0.0042**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**55.84**	**51.57**	**60.11**	**54.98**	**0.0047**	**0.0040**	**0.0055**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**64.15**	**58.80**	**69.50**	**62.87**	**0.0064**	**0.0053**	**0.0078**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**63.78**	**58.81**	**68.75**	**62.40**	**0.0063**	**0.0053**	**0.0076**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**72.69**	**65.94**	**79.44**	**70.94**	**0.0087**	**0.0068**	**0.0110**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**74.08**	**67.24**	**80.92**	**72.37**	**0.0091**	**0.0072**	**0.0116**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**76.51**	**69.94**	**83.08**	**75.01**	**0.0100**	**0.0079**	**0.0125**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0002	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**71.55**	**65.48**	**77.62**	**70.36**	**0.0084**	**0.0067**	**0.0103**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**64.33**	**58.00**	**70.66**	**63.43**	**0.0065**	**0.0051**	**0.0081**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**56.77**	**52.03**	**61.51**	**56.23**	**0.0049**	**0.0041**	**0.0058**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0001	0.0001	120.19	120.19	0.10%	1.26%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.52**	**48.90**	**54.14**	**51.20**	**0.0040**	**0.0036**	**0.0044**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Isopropyl benzene						0.0001	0.0000	0.0001	120.19	120.19	0.10%	1.25%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-933 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**28.24**	**23.93**	**43.66**	**70.24**	**66.44**	**117.03**	**127.89**	**132.50**	**101.28**	**86.82**	**48.66**	**22.54**	**869.22**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0235	0.0242	0.0319	0.0397	0.0368	0.0497	0.0502	0.0480	0.0446	0.0472	0.0355	0.0192		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9944	0.9949	0.9935	0.9912	0.9913	0.9881	0.9875	0.9864	0.9885	0.9911	0.9933	0.9945		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34	402,445.34		Calculated Using Equation 1-3
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143	26.143		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80	23.80		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**	**1.94**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.82	523.45	532.36	533.75	536.18	531.22	524.00	516.44	511.19		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.29	509.79	516.36	525.10	524.82	534.10	535.46	537.69	532.42	524.91	516.99	511.50		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0235**	**0.0242**	**0.0319**	**0.0397**	**0.0368**	**0.0497**	**0.0502**	**0.0480**	**0.0446**	**0.0472**	**0.0355**	**0.0192**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	12.68	13.01	17.08	21.42	19.90	27.01	27.34	26.29	24.28	25.32	18.98	10.48		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0068	0.0072	0.0079	0.0067	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0046	0.0042	0.0055	0.0078	0.0076	0.0110	0.0116	0.0125	0.0103	0.0081	0.0058	0.0044		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.87	509.23	515.51	523.82	523.45	532.36	533.75	536.18	531.22	524.00	516.44	511.19		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.70	505.98	511.24	518.47	518.48	525.61	526.91	529.61	525.15	517.67	511.70	508.57		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.04	512.48	519.78	529.17	528.42	539.11	540.59	542.75	537.29	530.33	521.18	513.81		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9944**	**0.9949**	**0.9935**	**0.9912**	**0.9913**	**0.9881**	**0.9875**	**0.9864**	**0.9885**	**0.9911**	**0.9933**	**0.9945**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433	26.1433		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**244.33**	**200.37**	**278.32**	**360.47**	**367.68**	**481.61**	**521.32**	**565.24**	**464.01**	**375.07**	**278.59**	**238.42**	**4,375.42**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0041	0.0037	0.0047	0.0064	0.0063	0.0087	0.0091	0.0100	0.0084	0.0065	0.0049	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	31,052,700	28,047,600	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700	31,052,700	30,051,000	31,052,700	30,051,000	31,052,700		Specified monthly throughput
N	Annual Turnovers	68.13	68.13	68.13	68.13	68.13	68.13	68.13	68.13	68.13	68.13	68.13	68.13		Calculated Using Equation 1-36
K_N	Turnover Factor	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070	0.6070		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60	47.60		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**272.57**	**224.30**	**321.97**	**430.71**	**434.11**	**598.64**	**649.21**	**697.74**	**565.29**	**461.89**	**327.25**	**260.96**	**5,244.64**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	272.57	224.30	321.97	430.71	434.11	598.64	649.21	697.74	565.29	461.89	327.25	260.96	5,244.64	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	3.41	2.80	4.04	5.43	5.47	7.55	8.19	8.79	7.13	5.82	4.11	3.27	66.01	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	3.41	2.80	4.04	5.43	5.47	7.55	8.19	8.79	7.13	5.82	4.11	3.27	66.01	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-933 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**5.08**	**4.62**	**5.80**	**7.76**	**7.67**	**10.38**	**10.87**	**11.79**	**9.99**	**7.81**	**5.99**	**4.96**	**11.79**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892	391,892		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**5.08**	**4.62**	**5.80**	**7.76**	**7.67**	**10.38**	**10.87**	**11.79**	**9.99**	**7.81**	**5.99**	**4.96**	**11.79**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	5.08	4.62	5.80	7.76	7.67	10.38	10.87	11.79	9.99	7.81	5.99	4.96	11.79	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.06	0.06	0.07	0.10	0.10	0.13	0.14	0.15	0.13	0.10	0.08	0.06	0.15	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.06	0.06	0.07	0.10	0.10	0.13	0.14	0.15	0.13	0.10	0.08	0.06	0.15	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-943 (Post-Project PTE)	S-1554
Location:	Martinez Refinery	
Type of Tank:	Vertical Fixed Roof Tank	

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	100.00	Tank Volume (bbl):	65,746.00
Net Throughput (bbl/yr):	10,000,000	Turnovers Per Year:	162.09
Maximum Pumping Rate (bbl/hr):	5,000.000		
Shell Height (ft):	48	Maximum Liquid Height (ft):	45.1
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Heated	Tank Insulation Type:	Full Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	4.17
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AX}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-943 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Feedstock	January	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	February	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	March	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	April	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	May	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	June	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	July	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	August	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	September	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	October	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	November	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.
Mixture/Product	Renewable Feedstock	December	140.00	140.00	140.00	140.00	0.0040	0.00400	0.00400	285.00	285.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.02.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-943 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943	0.9943		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88	210,800.88		Calculated Using Equation 1-3
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840	26.840		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**	**1.39**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Fully insulated tanks assumed equal to $\overline{T}_{LA}$
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	--	--	--	--	--	--	--	--	--	--	--	--		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	--	--	--	--	--	--	--	--	--	--	--	--		No vapor temperature variation for fully insulated tanks
ΔP_V	Daily Vapor Pressure Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**	**0.9943**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400	26.8400		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**297.1311**	**268.3764**	**297.1311**	**287.5462**	**297.1311**	**287.5462**	**297.1311**	**297.1311**	**287.5462**	**297.1311**	**287.5462**	**297.1311**	**3,498.4788**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	35,671,233	32,219,178	35,671,233	34,520,548	35,671,233	34,520,548	35,671,233	35,671,233	34,520,548	35,671,233	34,520,548	35,671,233		Specified monthly throughput
N	Annual Turnovers	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09	162.09		Calculated Using Equation 1-36
K_N	Turnover Factor	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518	0.3518		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**297.131**	**268.376**	**297.131**	**287.546**	**297.131**	**287.546**	**297.131**	**297.131**	**287.546**	**297.131**	**287.546**	**297.131**	**3,498.479**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	297.131	268.376	297.131	287.546	297.131	287.546	297.131	297.131	287.546	297.131	287.546	297.131	3,498.479	Sum of VOC Component Emissions

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-943 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	**4.97345**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00	285.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67	599.67		Equals Liquid Bulk Temperature
FR_M	Maximum Filling Rate for Tank (gal/hr)	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	**4.973**	Calculated Using Equation 2-1
L_{TC}	Total VOC Losses (lb/hr)	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	4.973	Sum of VOC Component Emissions

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
H_2S, NH_3, and NaOH Calculations for Various Tanks

NaOH Emissions from Caustic Storage Tank

	Post-Project PTE (lb/year)	
Source ID	**S-1468**	**S-2006**
Tank ID	A-877	A-958
Material	Spent Caustic	Fresh Caustic
Annual throughput (gal/year)	4,905,600	4,905,600
Working Water losses (lb/year)	627	615
Standing Water losses (lb/year)	942	338
Estimated Additional "Throughput" from Standing Losses[1] (gal)	7,369,374	2,695,069
Total Effective Throughput (gal)	12,274,974	7,600,669
Total Effective Throughput (m^3)	46,465.8	28,771.7
NaOH Emissions[2] (mg NaOH/year)	92,931.7	57,543.3
NaOH Emissions (lb NaOH/year)	**0.205**	**0.127**

	Post-Project PTE (lb/hr)	
Source ID	**S-1468**	**S-2006**
Tank ID	A-877	A-958
Material	Spent Caustic	Fresh Caustic
Maximum Hourly Throughput (gal/hr)	42,000	311,338
Maximum Effective Throughput (m^3)	159.0	1,178.5
NaOH Emissions[2] (mg NaOH/hr)	318.0	2,357.1
NaOH Emissions (lb NaOH/hr)	**0.001**	**0.005**

Notes:
(1) Conservatively assumed additional "throughput" based on the total water or VOC losses shown above, divided by just the working losses shown above.
(2) Solid caustic (sodium hydroxide, NaOH) has an extremely low vapor pressure and needs to be heated to 513 °C just to have an equilibrium vapor pressure of 1 Pa ≈ 0.0075 mm Hg [*CRC Handbook of Chemistry and Physics* , 78th edition (1997-1998), p. 6-66.]. Because it is less volatile than water, studies of the vapor pressure above caustic solutions show that the total vapor pressure above the solution decreases as the NaOH concentration increases [See, for example, D.S. Davis (1942), "*Vapor Pressure Nomographs for Aqueous Sodium Hydroxide Solutions* ", Industrial and Engineering Chemistry 34(9), 1131-1132.], and essentially all of the vapor pressure above the solutions is still just water vapor.

That being said, it is well known that the vapors above concentrated NaOH can be a respiratory irritant and that NaOH can be present in aerosols which are not accounted for by vapor-liquid equilibrium calculations. We are not aware of any model that would provide a quantitative estimate of aerosol generation. However, measurements of exposures in the aluminum production and textile industries have been made, and for processes most similar to ours (i.e., no heating/sparging/splashing) – i.e., measurements made on top of a tank being filled with caustic wash, and near NaOH storage – the exposures were measured as being approximately 1-2 mg/m^3 [European Chemicals Bureau, European Union Risk Assessment Report: sodium hydroxide (Volume: 73), EUR 23040 EN, Final Report, 2007, pp. 50-53.]. These calculations conservatively assume a concentration of 2 mg $NaOH/m^3$ of displaced vapor space.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-958 (Post-Project PTE)	S-2006
Location:	Martinez Refinery	
Type of Tank:	Vertical Fixed Roof Tank	

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	48.00	Tank Volume (bbl):	7,412.81
Net Throughput (bbl/yr):	116,800	Turnovers Per Year:	16.47
Maximum Pumping Rate (bbl/hr):	7,412.810		
Shell Height (ft):	24	Maximum Liquid Height (ft):	23
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	1.50
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_L	Z_V	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Water	January	52.17	48.89	55.45	51.78	0.1920	0.16991	0.21653	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	February	49.52	46.17	52.87	49.00	0.1740	0.15332	0.19698	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	March	55.78	51.40	60.16	54.98	0.2192	0.18658	0.25665	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	April	64.06	58.59	69.53	62.87	0.2946	0.24264	0.35608	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	May	63.68	58.62	68.74	62.40	0.2907	0.24291	0.34655	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	June	72.56	65.68	79.44	70.94	0.3948	0.31179	0.49638	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	July	73.96	66.99	80.93	72.37	0.4138	0.32629	0.52118	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	August	76.41	69.69	83.13	75.01	0.4491	0.35807	0.55973	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	September	71.47	65.24	77.70	70.36	0.3805	0.30706	0.46872	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	October	64.27	57.73	70.81	63.43	0.2968	0.23526	0.37196	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	November	56.74	51.82	61.66	56.23	0.2269	0.18954	0.27067	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.
Mixture/Product	Water	December	51.49	48.78	54.20	51.20	0.1872	0.16917	0.20690	18.02	18.02	--	--	Equation 1-26 (Antoine's equation). A = 8.07, B = 1730.63, C = 233.42.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-958 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**11.6783**	**9.8671**	**17.5326**	**27.4253**	**25.8993**	**44.4799**	**48.5129**	**50.2036**	**39.0299**	**34.1265**	**19.6441**	**9.4546**	**337.8539**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0006	0.0006	0.0007	0.0009	0.0009	0.0012	0.0013	0.0014	0.0012	0.0009	0.0007	0.0006		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0288	0.0293	0.0388	0.0496	0.0458	0.0646	0.0659	0.0643	0.0582	0.0594	0.0437	0.0238		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.8832	0.8930	0.8688	0.8313	0.8331	0.7862	0.7781	0.7637	0.7923	0.8302	0.8648	0.8858		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25	23,524.25		Calculated Using Equation 1-3
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	13.000	13.000	13.000	13.000	13.000	13.000	13.000	13.000	13.000	13.000	13.000	13.000		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0006**	**0.0006**	**0.0007**	**0.0009**	**0.0009**	**0.0012**	**0.0013**	**0.0014**	**0.0012**	**0.0009**	**0.0007**	**0.0006**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1920	0.1740	0.2192	0.2946	0.2907	0.3948	0.4138	0.4491	0.3805	0.2968	0.2269	0.1872		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.45	523.73	523.35	532.23	533.63	536.08	531.14	523.94	516.41	511.16		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia\text{-}ft^3/(lbmol\text{-}°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.23	509.71	516.24	524.92	524.63	533.85	535.22	537.48	532.25	524.78	516.91	511.46		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor ($Btu/ft^2\text{-}day$)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0288**	**0.0293**	**0.0388**	**0.0496**	**0.0458**	**0.0646**	**0.0659**	**0.0643**	**0.0582**	**0.0594**	**0.0437**	**0.0238**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.11	13.38	17.52	21.87	20.23	27.52	27.88	26.88	24.91	26.14	19.66	10.85		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.05	0.04	0.07	0.11	0.10	0.18	0.19	0.20	0.16	0.14	0.08	0.04		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1920	0.1740	0.2192	0.2946	0.2907	0.3948	0.4138	0.4491	0.3805	0.2968	0.2269	0.1872		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.1699	0.1533	0.1866	0.2426	0.2429	0.3118	0.3263	0.3581	0.3071	0.2353	0.1895	0.1692		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.2165	0.1970	0.2567	0.3561	0.3465	0.4964	0.5212	0.5597	0.4687	0.3720	0.2707	0.2069		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.84	509.19	515.45	523.73	523.35	532.23	533.63	536.08	531.14	523.94	516.41	511.16		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.56	505.84	511.07	518.26	518.29	525.35	526.66	529.36	524.91	517.40	511.49	508.45		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.12	512.54	519.83	529.20	528.41	539.11	540.60	542.80	537.37	530.48	521.33	513.87		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.8832**	**0.8930**	**0.8688**	**0.8313**	**0.8331**	**0.7862**	**0.7781**	**0.7637**	**0.7923**	**0.8302**	**0.8648**	**0.8858**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.1920	0.1740	0.2192	0.2946	0.2907	0.3948	0.4138	0.4491	0.3805	0.2968	0.2269	0.1872		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**35.0414**	**28.8191**	**39.6934**	**50.7824**	**51.8082**	**66.9063**	**72.2902**	**78.1273**	**64.6760**	**52.8767**	**39.7241**	**34.2211**	**614.9661**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.1920	0.1740	0.2192	0.2946	0.2907	0.3948	0.4138	0.4491	0.3805	0.2968	0.2269	0.1872		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	416,640	376,320	416,640	403,200	416,640	403,200	416,640	416,640	403,200	416,640	403,200	416,640		Specified monthly throughput
N	Annual Turnovers	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47	16.47		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**46.720**	**38.686**	**57.226**	**78.208**	**77.707**	**111.386**	**120.803**	**128.331**	**103.706**	**87.003**	**59.368**	**43.676**	**952.820**	**Calculated Using Equation 2-1**
L_T	Total Non-Pollutant Losses (lb/month)	46.7196	38.6862	57.2260	78.2077	77.7075	111.3863	120.8031	128.3309	103.7058	87.0032	59.3682	43.6756	952.8200	Sum of Non-Pollutant Component Emissions

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-958 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**26.20762**	**23.86983**	**29.70996**	**39.30574**	**38.81308**	**51.82623**	**54.18665**	**58.53989**	**50.05025**	**39.58034**	**30.70677**	**25.58959**	**58.53989**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02	18.02		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.19198	0.17395	0.21917	0.29462	0.29071	0.39477	0.41384	0.44914	0.38046	0.29680	0.22695	0.18720		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	311,338	311,338	311,338	311,338	311,338	311,338	311,338	311,338	311,338	311,338	311,338	311,338		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**26.208**	**23.870**	**29.710**	**39.306**	**38.813**	**51.826**	**54.187**	**58.540**	**50.050**	**39.580**	**30.707**	**25.590**	**58.540**	Calculated Using Equation 2-1
L_{TI}	Total Non-Pollutant Losses (lb/hr)	26.20762	23.86983	29.70996	39.30574	38.81308	51.82623	54.18665	58.53989	50.05025	39.58034	30.70677	25.58959	58.53989	Sum of Non-Pollutant Component Emissions

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-961 (Post-Project PTE)	S-2012	
Location:	Martinez Refinery		
Type of Tank:	Horizontal Fixed Roof Tank		

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	8.95	Tank Volume (bbl):	190.00
Net Throughput (bbl/yr):	87,053	Turnovers Per Year:	361.63
Maximum Pumping Rate (bbl/hr):	190.476		
Shell Length (ft):	21.5		
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average

Breather Vent Settings

Vacuum Settings (psig):	-0.04	Pressure Settings (psig):	0.04

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.52**	**49.03**	**56.01**	**51.94**	**0.0042**	**0.00363**	**0.00474**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.85%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.74%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**50.00**	**46.35**	**53.65**	**49.21**	**0.0038**	**0.00327**	**0.00433**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.94%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.00%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**56.50**	**51.65**	**61.35**	**55.31**	**0.0048**	**0.00402**	**0.00578**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00034	78.11	78.11	0.01%	3.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**65.14**	**58.96**	**71.32**	**63.35**	**0.0066**	**0.00529**	**0.00830**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00032	0.00045	78.11	78.11	0.01%	3.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.41%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**64.84**	**59.01**	**70.67**	**62.92**	**0.0066**	**0.00530**	**0.00811**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-961 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

	Benzene						0.0004	0.00032	0.00044	78.11	78.11	0.01%	3.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.42%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**74.04**	**66.18**	**81.90**	**71.60**	**0.0091**	**0.00690**	**0.01199**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00058	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0006	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**75.41**	**67.48**	**83.34**	**73.02**	**0.0096**	**0.00723**	**0.01259**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00011	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00040	0.00061	78.11	78.11	0.01%	3.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.18%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.43%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**77.68**	**70.12**	**85.24**	**75.57**	**0.0104**	**0.00795**	**0.01343**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00007	0.00012	120.19	120.19	0.14%	0.800271%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00043	0.00064	78.11	78.11	0.01%	3.045085%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000416%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.133162%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.583562%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385684%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.181465%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.381264%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.102302%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.895960%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.173559%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**72.48**	**65.60**	**79.36**	**70.81**	**0.0086**	**0.00676**	**0.01099**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**65.03**	**58.03**	**72.03**	**63.77**	**0.0066**	**0.00511**	**0.00851**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00045	78.11	78.11	0.01%	3.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.42%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**57.19**	**52.01**	**62.37**	**56.44**	**0.0050**	**0.00407**	**0.00600**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00035	78.11	78.11	0.01%	3.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.61%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.83%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.76**	**48.89**	**54.63**	**51.32**	**0.0040**	**0.00361**	**0.00450**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-961 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.87%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.76%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.95%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-961 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.0449**	**0.0393**	**0.0763**	**0.1295**	**0.1242**	**0.2247**	**0.2448**	**0.2492**	**0.1848**	**0.1536**	**0.0817**	**0.0341**	**1.5871**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0219	0.0232	0.0322	0.0419	0.0393	0.0538	0.0542	0.0512	0.0465	0.0482	0.0348	0.0171		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9992	0.9993	0.9991	0.9988	0.9988	0.9983	0.9982	0.9981	0.9984	0.9988	0.9991	0.9992		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70		Calculated Using Equation 1-3
D	Tank Diameter (ft)	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95		See 'Tank Identification and Physical Characteristics' table above
L	Tank Shell Length (ft)	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50		See 'Tank Identification and Physical Characteristics' table above
D_E	Effective Diameter of HFRT (ft)	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65		Calculated Using Equation 1-14
H_E	Effective Height of HFRT (ft)	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03		Calculated Using Equation 1-15
H_{VO}	Vapor Space Outage (ft)	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513		Equal to one half of the effective height per notes under Equation 1-15
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.19	509.67	516.17	524.81	524.51	533.71	535.08	537.35	532.15	524.70	516.86	511.43		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.61	508.88	514.98	523.02	522.59	531.27	532.69	535.24	530.48	523.44	516.11	510.99		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.77	510.45	517.36	526.59	526.44	536.14	537.47	539.46	533.82	525.97	517.62	511.87		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0219**	**0.0232**	**0.0322**	**0.0419**	**0.0393**	**0.0538**	**0.0542**	**0.0512**	**0.0465**	**0.0482**	**0.0348**	**0.0171**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.95	14.58	19.38	24.72	23.34	31.43	31.72	30.22	27.51	28.01	20.72	11.47		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0069	0.0072	0.0080	0.0068	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0043	0.0058	0.0083	0.0081	0.0120	0.0126	0.0134	0.0110	0.0085	0.0060	0.0045		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.19	509.67	516.17	524.81	524.51	533.71	535.08	537.35	532.15	524.70	516.86	511.43		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.70	506.02	511.32	518.63	518.68	525.85	527.15	529.79	525.27	517.70	511.68	508.56		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.68	513.32	521.02	530.99	530.34	541.57	543.01	544.91	539.03	531.70	522.04	514.30		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9992**	**0.9993**	**0.9991**	**0.9988**	**0.9988**	**0.9983**	**0.9982**	**0.9981**	**0.9984**	**0.9988**	**0.9991**	**0.9992**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**1.0161**	**0.8370**	**1.1710**	**1.5324**	**1.5668**	**2.0691**	**2.2378**	**2.4130**	**1.9669**	**1.5791**	**1.1624**	**0.9888**	**18.5405**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	310,527	280,476	310,527	300,510	310,527	300,510	310,527	310,527	300,510	310,527	300,510	310,527		Specified monthly throughput
N	Annual Turnovers	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63		Calculated Using Equation 1-36
K_N	Turnover Factor	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496		Per notes to Equation 1-35
D	Tank Diameter (ft)	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**1.061**	**0.876**	**1.247**	**1.662**	**1.691**	**2.294**	**2.483**	**2.662**	**2.152**	**1.733**	**1.244**	**1.023**	**20.128**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	1.061	0.876	1.247	1.662	1.691	2.294	2.483	2.662	2.152	1.733	1.244	1.023	20.128	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.130	0.109	0.150	0.191	0.194	0.251	0.270	0.286	0.238	0.199	0.149	0.126	2.293	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.041	0.035	0.046	0.057	0.058	0.072	0.077	0.081	0.069	0.059	0.046	0.040	0.680	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	0.029	0.025	0.033	0.040	0.041	0.051	0.054	0.057	0.048	0.042	0.032	0.028	0.480	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.12	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0041	0.0034	0.0048	0.0064	0.0065	0.0089	0.0096	0.0103	0.0083	0.0067	0.0048	0.0039	0.0775	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.002	0.001	0.002	0.003	0.003	0.004	0.004	0.005	0.004	0.003	0.002	0.002	0.034	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.09	0.08	0.06	0.05	0.04	0.73	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.008	0.006	0.009	0.013	0.013	0.018	0.020	0.021	0.017	0.013	0.009	0.008	0.157	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.23	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.18	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.013	0.011	0.015	0.020	0.021	0.027	0.029	0.031	0.026	0.021	0.015	0.013	0.243	Calculated using Equations 40-1 through 40-9
														0.00	

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-961 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Horizontal Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.10500**	**0.09580**	**0.12115**	**0.16400**	**0.16231**	**0.22169**	**0.23201**	**0.25004**	**0.21044**	**0.16338**	**0.12416**	**0.10215**	**0.25004**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00415	0.00377	0.00483	0.00664	0.00657	0.00913	0.00958	0.01037	0.00864	0.00662	0.00495	0.00403		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.105**	**0.096**	**0.121**	**0.164**	**0.162**	**0.222**	**0.232**	**0.250**	**0.210**	**0.163**	**0.124**	**0.102**	**0.250**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.105	0.096	0.121	0.164	0.162	0.222	0.232	0.250	0.210	0.163	0.124	0.102	0.250	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.013	0.012	0.015	0.019	0.019	0.024	0.025	0.027	0.023	0.019	0.015	0.013	0.027	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.004	0.004	0.004	0.006	0.006	0.007	0.007	0.008	0.007	0.006	0.005	0.004	0.008	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.003	0.003	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.004	0.003	0.003	0.005	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00040	0.00037	0.00047	0.00063	0.00063	0.00086	0.00090	0.00096	0.00081	0.00063	0.00048	0.00039	0.00096	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.003	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-981 (Post-Project PTE)	S-2011	
Location:	Martinez Refinery		
Type of Tank:	Horizontal Fixed Roof Tank		

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	8.95	Tank Volume (bbl):	190.00
Net Throughput (bbl/yr):	87,053	Turnovers Per Year:	361.63
Maximum Pumping Rate (bbl/hr):	190.476		
Shell Length (ft):	21.5		
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	Average

Breather Vent Settings

Vacuum Settings (psig):	-0.04	Pressure Settings (psig):	0.04

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**No. 2 Fuel Oil**	**January**	**52.52**	**49.03**	**56.01**	**51.94**	**0.0042**	**0.00363**	**0.00474**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00029	78.11	78.11	0.01%	3.85%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.74%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0003	92.14	92.14	0.04%	3.94%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**February**	**50.00**	**46.35**	**53.65**	**49.21**	**0.0038**	**0.00327**	**0.00433**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.74%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0002	0.00022	0.00027	78.11	78.11	0.01%	3.94%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0001	0.0002	84.16	84.16	0.01%	2.81%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	4.00%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	1.17%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0000	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.26%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**March**	**56.50**	**51.65**	**61.35**	**55.31**	**0.0048**	**0.00402**	**0.00578**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00034	78.11	78.11	0.01%	3.71%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.63%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.84%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**April**	**65.14**	**58.96**	**71.32**	**63.35**	**0.0066**	**0.00529**	**0.00830**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00032	0.00045	78.11	78.11	0.01%	3.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.41%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**May**	**64.84**	**59.01**	**70.67**	**62.92**	**0.0066**	**0.00530**	**0.00811**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-981 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

	Benzene						0.0004	0.00032	0.00044	78.11	78.11	0.01%	3.43%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.42%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**June**	**74.04**	**66.18**	**81.90**	**71.60**	**0.0091**	**0.00690**	**0.01199**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00039	0.00058	78.11	78.11	0.01%	3.15%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.21%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0004	0.0006	92.14	92.14	0.04%	3.46%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**July**	**75.41**	**67.48**	**83.34**	**73.02**	**0.0096**	**0.00723**	**0.01259**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00011	120.19	120.19	0.14%	0.80%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00040	0.00061	78.11	78.11	0.01%	3.11%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.18%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.18%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.43%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.11%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.18%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**August**	**77.68**	**70.12**	**85.24**	**75.57**	**0.0104**	**0.00795**	**0.01343**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00007	0.00012	120.19	120.19	0.14%	0.800271%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00043	0.00064	78.11	78.11	0.01%	3.045085%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.000416%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.133162%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0001	0.0001	106.17	106.17	0.02%	0.583562%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0001	120.19	120.19	0.03%	0.385684%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.181465%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0005	0.0004	0.0006	92.14	92.14	0.04%	3.381264%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.102302%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.895960%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.173559%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**September**	**72.48**	**65.60**	**79.36**	**70.81**	**0.0086**	**0.00676**	**0.01099**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00006	0.00010	120.19	120.19	0.14%	0.79%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0005	0.00038	0.00055	78.11	78.11	0.01%	3.19%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0003	0.0003	0.0004	84.16	84.16	0.01%	2.24%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0001	0.0000	0.0001	106.17	106.17	0.02%	0.59%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0004	0.0003	0.0005	92.14	92.14	0.04%	3.49%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.12%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.90%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0002	106.17	106.17	0.05%	1.19%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**October**	**65.03**	**58.03**	**72.03**	**63.77**	**0.0066**	**0.00511**	**0.00851**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0001	0.00004	0.00007	120.19	120.19	0.14%	0.78%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0004	0.00031	0.00045	78.11	78.11	0.01%	3.42%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0003	84.16	84.16	0.01%	2.42%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0001	106.17	106.17	0.02%	0.60%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.39%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.17%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0003	0.0004	92.14	92.14	0.04%	3.65%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.13%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	0.91%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.21%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**November**	**57.19**	**52.01**	**62.37**	**56.44**	**0.0050**	**0.00407**	**0.00600**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**
	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00005	120.19	120.19	0.14%	0.76%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00026	0.00035	78.11	78.11	0.01%	3.68%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.61%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.61%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.16%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0003	0.0002	0.0003	92.14	92.14	0.04%	3.83%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.15%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0001	0.0000	0.0001	106.17	106.17	0.05%	0.92%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.24%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.
Mixture/Product	**No. 2 Fuel Oil**	**December**	**51.76**	**48.89**	**54.63**	**51.32**	**0.0040**	**0.00361**	**0.00450**	**188.00**	**130.00**	--	--	**Equation 1-25. A = 14.07 and B = 10015.55.**

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-981 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

	Trimethylbenzene (1,2,4)						0.0000	0.00003	0.00004	120.19	120.19	0.14%	0.75%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Benzene						0.0003	0.00024	0.00028	78.11	78.11	0.01%	3.87%	Equation 1-26 (Antoine's equation). A = 6.9, B = 1211, C = 220.79.
	Cresol (-m)						0.0000	0.0000	0.0000	108.14	108.14	0.00%	0.00%	Equation 1-26 (Antoine's equation). A = 7.47, B = 1833.1, C = 196.74.
	Cyclohexane						0.0002	0.0002	0.0002	84.16	84.16	0.01%	2.76%	Equation 1-26 (Antoine's equation). A = 6.84, B = 1203.5, C = 222.86.
	Ethylbenzene						0.0000	0.0000	0.0000	106.17	106.17	0.02%	0.62%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
	Isopropyl benzene						0.0000	0.0000	0.0000	120.19	120.19	0.03%	0.38%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Naphthalene						0.0000	0.0000	0.0000	128.17	128.17	0.25%	0.15%	Equation 1-26 (Antoine's equation). A = 7.14, B = 1831.6, C = 211.82.
	Toluene						0.0002	0.0002	0.0002	92.14	92.14	0.04%	3.95%	Equation 1-26 (Antoine's equation). A = 7.01, B = 1377.6, C = 222.64.
	Xylene (m)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.16%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Xylene (o)						0.0000	0.0000	0.0001	106.17	106.17	0.05%	0.93%	Equation 1-26 (Antoine's equation). A = 6.99, B = 1474.7, C = 213.69.
	Xylene (p)						0.0001	0.0001	0.0001	106.17	106.17	0.05%	1.25%	Equation 1-26 (Antoine's equation). A = 7.02, B = 1474.4, C = 217.77.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank A-981 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Horizontal Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.0449**	**0.0393**	**0.0763**	**0.1295**	**0.1242**	**0.2247**	**0.2448**	**0.2492**	**0.1848**	**0.1536**	**0.0817**	**0.0341**	**1.5871**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0219	0.0232	0.0322	0.0419	0.0393	0.0538	0.0542	0.0512	0.0465	0.0482	0.0348	0.0171		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9992	0.9993	0.9991	0.9988	0.9988	0.9983	0.9982	0.9981	0.9984	0.9988	0.9991	0.9992		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70	675.70		Calculated Using Equation 1-3
D	Tank Diameter (ft)	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95		See 'Tank Identification and Physical Characteristics' table above
L	Tank Shell Length (ft)	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50		See 'Tank Identification and Physical Characteristics' table above
D_E	Effective Diameter of HFRT (ft)	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65		Calculated Using Equation 1-14
H_E	Effective Height of HFRT (ft)	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03	7.03		Calculated Using Equation 1-15
H_{VO}	Vapor Space Outage (ft)	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513	3.513		Equal to one half of the effective height per notes under Equation 1-15
W_V	**Vapor Density (lb/ft^3)**	**0.0001**	**0.0001**	**0.0001**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0001**	**0.0001**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.19	509.67	516.17	524.81	524.51	533.71	535.08	537.35	532.15	524.70	516.86	511.43		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.61	508.88	514.98	523.02	522.59	531.27	532.69	535.24	530.48	523.44	516.11	510.99		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.77	510.45	517.36	526.59	526.44	536.14	537.47	539.46	533.82	525.97	517.62	511.87		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0219**	**0.0232**	**0.0322**	**0.0419**	**0.0393**	**0.0538**	**0.0542**	**0.0512**	**0.0465**	**0.0482**	**0.0348**	**0.0171**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.95	14.58	19.38	24.72	23.34	31.43	31.72	30.22	27.51	28.01	20.72	11.47		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0036	0.0033	0.0040	0.0053	0.0053	0.0069	0.0072	0.0080	0.0068	0.0051	0.0041	0.0036		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0047	0.0043	0.0058	0.0083	0.0081	0.0120	0.0126	0.0134	0.0110	0.0085	0.0060	0.0045		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.19	509.67	516.17	524.81	524.51	533.71	535.08	537.35	532.15	524.70	516.86	511.43		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.70	506.02	511.32	518.63	518.68	525.85	527.15	529.79	525.27	517.70	511.68	508.56		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.68	513.32	521.02	530.99	530.34	541.57	543.01	544.91	539.03	531.70	522.04	514.30		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9992**	**0.9993**	**0.9991**	**0.9988**	**0.9988**	**0.9983**	**0.9982**	**0.9981**	**0.9984**	**0.9988**	**0.9991**	**0.9992**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131	3.5131		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**1.0161**	**0.8370**	**1.1710**	**1.5324**	**1.5668**	**2.0691**	**2.2378**	**2.4130**	**1.9669**	**1.5791**	**1.1624**	**0.9888**	**18.5405**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0042	0.0038	0.0048	0.0066	0.0066	0.0091	0.0096	0.0104	0.0086	0.0066	0.0050	0.0040		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	310,527	280,476	310,527	300,510	310,527	300,510	310,527	310,527	300,510	310,527	300,510	310,527		Specified monthly throughput
N	Annual Turnovers	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63	361.63		Calculated Using Equation 1-36
K_N	Turnover Factor	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496	0.2496		Per notes to Equation 1-35
D	Tank Diameter (ft)	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95	8.95		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**1.061**	**0.876**	**1.247**	**1.662**	**1.691**	**2.294**	**2.483**	**2.662**	**2.152**	**1.733**	**1.244**	**1.023**	**20.128**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	1.061	0.876	1.247	1.662	1.691	2.294	2.483	2.662	2.152	1.733	1.244	1.023	20.128	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.130	0.109	0.150	0.191	0.194	0.251	0.270	0.286	0.238	0.199	0.149	0.126	2.293	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/month)	0.041	0.035	0.046	0.057	0.058	0.072	0.077	0.081	0.069	0.059	0.046	0.040	0.680	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/month)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/month)	0.029	0.025	0.033	0.040	0.041	0.051	0.054	0.057	0.048	0.042	0.032	0.028	0.480	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.12	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.0041	0.0034	0.0048	0.0064	0.0065	0.0089	0.0096	0.0103	0.0083	0.0067	0.0048	0.0039	0.0775	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/month)	0.002	0.001	0.002	0.003	0.003	0.004	0.004	0.005	0.004	0.003	0.002	0.002	0.034	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/month)	0.04	0.04	0.05	0.06	0.06	0.08	0.09	0.09	0.08	0.06	0.05	0.04	0.73	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.008	0.006	0.009	0.013	0.013	0.018	0.020	0.021	0.017	0.013	0.009	0.008	0.157	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.23	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/month)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.18	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/month)	0.013	0.011	0.015	0.020	0.021	0.027	0.029	0.031	0.026	0.021	0.015	0.013	0.243	Calculated using Equations 40-1 through 40-9
														0.00	

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank A-981 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Horizontal Fixed Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.10500**	**0.09580**	**0.12115**	**0.16400**	**0.16231**	**0.22169**	**0.23201**	**0.25004**	**0.21044**	**0.16338**	**0.12416**	**0.10215**	**0.25004**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00415	0.00377	0.00483	0.00664	0.00657	0.00913	0.00958	0.01037	0.00864	0.00662	0.00495	0.00403		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.105**	**0.096**	**0.121**	**0.164**	**0.162**	**0.222**	**0.232**	**0.250**	**0.210**	**0.163**	**0.124**	**0.102**	**0.250**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.105	0.096	0.121	0.164	0.162	0.222	0.232	0.250	0.210	0.163	0.124	0.102	0.250	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.013	0.012	0.015	0.019	0.019	0.024	0.025	0.027	0.023	0.019	0.015	0.013	0.027	Sum of HAP Component Emissions
L_{TI}	Benzene Losses (lb/hr)	0.004	0.004	0.004	0.006	0.006	0.007	0.007	0.008	0.007	0.006	0.005	0.004	0.008	Calculated using Equations 40-1 through 40-9
L_{TI}	Cresol (-m) Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Cyclohexane Losses (lb/hr)	0.003	0.003	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.004	0.003	0.003	0.005	Calculated using Equations 40-1 through 40-9
L_{TI}	Ethylbenzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00040	0.00037	0.00047	0.00063	0.00063	0.00086	0.00090	0.00096	0.00081	0.00063	0.00048	0.00039	0.00096	Calculated using Equations 40-1 through 40-9
L_{TI}	Naphthalene Losses (lb/hr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Calculated using Equations 40-1 through 40-9
L_{TI}	Toluene Losses (lb/hr)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (o) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (p) Losses (lb/hr)	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.003	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank MTK-10162 (Post-Project PTE)	S-2005	
Location:	Martinez Refinery		
Type of Tank:	Vertical Fixed Roof Tank		

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	7.00	Tank Volume (bbl):	42.84
Net Throughput (bbl/yr):	1,418	Turnovers Per Year:	39.41
Maximum Pumping Rate (bbl/hr):	0.162		
Shell Height (ft):	7	Maximum Liquid Height (ft):	6.25
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	Tan	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Cone	Height (ft):	0.22
Fixed Roof Paint Color/Shade:	Tan	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	-0.03	Pressure Settings (psig):	0.03

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AA}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Heavy Oil Demulsifier**	**January**	**53.12**	**48.92**	**57.32**	**52.29**	**0.0368**	**0.0312**	**0.0433**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0022	0.0018	0.0026	120.19	120.19	20.00%	5.99%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0008	0.0006	0.0009	120.19	120.19	5.00%	2.10%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0009	0.0008	0.0011	120.19	120.19	5.00%	2.52%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0040	0.0034	0.0046	106.17	106.17	5.00%	9.60%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0004	0.0003	0.0004	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0009	0.0008	0.0011	106.17	106.17	1.00%	2.21%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**February**	**50.80**	**46.31**	**55.29**	**49.69**	**0.0336**	**0.0281**	**0.0400**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0020	0.0016	0.0024	120.19	120.19	20.00%	5.94%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0007	0.0006	0.0008	120.19	120.19	5.00%	2.08%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0008	0.0007	0.0010	120.19	120.19	5.00%	2.51%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0037	0.0031	0.0043	106.17	106.17	5.00%	9.65%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0003	0.0003	0.0004	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0008	0.0007	0.0010	106.17	106.17	1.00%	2.22%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**March**	**57.72**	**51.67**	**63.77**	**56.03**	**0.0439**	**0.0348**	**0.0551**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0027	0.0021	0.0034	120.19	120.19	20.00%	6.10%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0009	0.0007	0.0012	120.19	120.19	5.00%	2.12%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0011	0.0009	0.0014	120.19	120.19	5.00%	2.55%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0047	0.0038	0.0058	106.17	106.17	5.00%	9.49%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0004	0.0003	0.0005	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0011	0.0009	0.0013	106.17	106.17	1.00%	2.18%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**April**	**66.97**	**59.11**	**74.83**	**64.44**	**0.0619**	**0.0463**	**0.0819**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0039	0.0028	0.0053	120.19	120.19	20.00%	6.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0013	0.0010	0.0018	120.19	120.19	5.00%	2.17%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0016	0.0012	0.0022	120.19	120.19	5.00%	2.59%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0065	0.0049	0.0084	106.17	106.17	5.00%	9.29%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0006	0.0005	0.0008	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0015	0.0011	0.0019	106.17	106.17	1.00%	2.13%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**May**	**66.82**	**59.27**	**74.37**	**64.09**	**0.0616**	**0.0466**	**0.0806**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0039	0.0029	0.0052	120.19	120.19	20.00%	6.30%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0013	0.0010	0.0018	120.19	120.19	5.00%	2.17%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0016	0.0012	0.0021	120.19	120.19	5.00%	2.59%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0065	0.0050	0.0083	106.17	106.17	5.00%	9.29%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0006	0.0005	0.0008	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0015	0.0011	0.0019	106.17	106.17	1.00%	2.13%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**June**	**76.53**	**66.44**	**86.62**	**73.08**	**0.0868**	**0.0607**	**0.1221**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0056	0.0038	0.0082	120.19	120.19	20.00%	6.51%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0019	0.0013	0.0028	120.19	120.19	5.00%	2.22%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0023	0.0016	0.0033	120.19	120.19	5.00%	2.64%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0089	0.0064	0.0123	106.17	106.17	5.00%	9.10%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0009	0.0006	0.0012	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0020	0.0015	0.0028	106.17	106.17	1.00%	2.08%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**July**	**77.86**	**67.72**	**88.00**	**74.47**	**0.0909**	**0.0636**	**0.1278**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0059	0.0040	0.0086	120.19	120.19	20.00%	6.54%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0020	0.0014	0.0029	120.19	120.19	5.00%	2.23%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0024	0.0016	0.0034	120.19	120.19	5.00%	2.65%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank MTK-10162 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

	Xylene (m)						0.0093	0.0067	0.0128	106.17	106.17	5.00%	9.07%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0009	0.0006	0.0013	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0021	0.0015	0.0029	106.17	106.17	1.00%	2.07%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**August**	**79.84**	**70.27**	**89.41**	**76.85**	**0.0973**	**0.0697**	**0.1338**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0064	0.0044	0.0091	120.19	120.19	20.00%	6.58%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0022	0.0015	0.0031	120.19	120.19	5.00%	2.24%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0026	0.0018	0.0036	120.19	120.19	5.00%	2.66%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0099	0.0073	0.0134	106.17	106.17	5.00%	9.03%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0010	0.0007	0.0013	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0023	0.0017	0.0031	106.17	106.17	1.00%	2.06%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**September**	**74.19**	**65.62**	**82.76**	**71.82**	**0.0800**	**0.0589**	**0.1074**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0052	0.0037	0.0071	120.19	120.19	20.00%	6.46%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0018	0.0013	0.0024	120.19	120.19	5.00%	2.21%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0021	0.0015	0.0029	120.19	120.19	5.00%	2.63%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0083	0.0062	0.0109	106.17	106.17	5.00%	9.14%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0008	0.0006	0.0011	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0019	0.0014	0.0025	106.17	106.17	1.00%	2.09%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**October**	**66.33**	**57.84**	**74.82**	**64.54**	**0.0605**	**0.0441**	**0.0818**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0038	0.0027	0.0053	120.19	120.19	20.00%	6.29%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0013	0.0009	0.0018	120.19	120.19	5.00%	2.17%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0016	0.0011	0.0022	120.19	120.19	5.00%	2.59%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0064	0.0047	0.0084	106.17	106.17	5.00%	9.30%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0006	0.0004	0.0008	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0015	0.0011	0.0019	106.17	106.17	1.00%	2.13%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**November**	**57.97**	**51.79**	**64.15**	**56.90**	**0.0443**	**0.0349**	**0.0558**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0027	0.0021	0.0035	120.19	120.19	20.00%	6.10%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0009	0.0007	0.0012	120.19	120.19	5.00%	2.12%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0011	0.0009	0.0014	120.19	120.19	5.00%	2.55%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0048	0.0038	0.0059	106.17	106.17	5.00%	9.48%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0004	0.0003	0.0006	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0011	0.0009	0.0014	106.17	106.17	1.00%	2.18%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.
Mixture/Product	**Heavy Oil Demulsifier**	**December**	**52.21**	**48.78**	**55.64**	**51.59**	**0.0355**	**0.0310**	**0.0406**	**120.00**	**120.00**	--	--	**Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.**
	Trimethylbenzene (1,2,3)						0.0021	0.0018	0.0025	120.19	120.19	20.00%	5.97%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1593.95, C = 207.07.
	Trimethylbenzene (1,2,4)						0.0007	0.0006	0.0009	120.19	120.19	5.00%	2.09%	Equation 1-26 (Antoine's equation). A = 7.04, B = 1573.3, C = 208.56.
	Trimethylbenzene (1,3,5)						0.0009	0.0008	0.0010	120.19	120.19	5.00%	2.52%	Equation 1-26 (Antoine's equation). A = 7.07, B = 1569.62, C = 209.57.
	Xylene (m)						0.0039	0.0034	0.0044	106.17	106.17	5.00%	9.62%	Equation 1-26 (Antoine's equation). A = 7, B = 1462.3, C = 215.11.
	Isopropyl benzene						0.0004	0.0003	0.0004	120.19	120.19	1.00%	1.00%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
	Ethylbenzene						0.0009	0.0008	0.0010	106.17	106.17	1.00%	2.21%	Equation 1-26 (Antoine's equation). A = 6.95, B = 1419.3, C = 212.61.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank MTK-10162 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.11**	**0.10**	**0.19**	**0.34**	**0.34**	**0.61**	**0.66**	**0.66**	**0.47**	**0.38**	**0.19**	**0.08**	**4.14**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0008	0.0007	0.0009	0.0013	0.0013	0.0018	0.0019	0.0020	0.0017	0.0013	0.0010	0.0008		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0295	0.0319	0.0441	0.0580	0.0556	0.0754	0.0758	0.0712	0.0635	0.0631	0.0451	0.0234		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9924	0.9930	0.9909	0.9872	0.9873	0.9822	0.9813	0.9800	0.9835	0.9875	0.9908	0.9926		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94	151.94		Calculated Using Equation 1-3
D	Tank Diameter (ft)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	3.948	3.948	3.948	3.948	3.948	3.948	3.948	3.948	3.948	3.948	3.948	3.948		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Cone Roof (ft)**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**		**Calculated Using 1-17**
H_R	Cone Roof Height (ft)	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0008**	**0.0007**	**0.0009**	**0.0013**	**0.0013**	**0.0018**	**0.0019**	**0.0020**	**0.0017**	**0.0013**	**0.0010**	**0.0008**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0368	0.0336	0.0439	0.0619	0.0616	0.0868	0.0909	0.0973	0.0800	0.0605	0.0443	0.0355		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.79	510.47	517.39	526.64	526.49	536.20	537.53	539.51	533.86	526.00	517.64	511.88		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3/(lbmol-°R)$)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.96	509.36	515.70	524.11	523.76	532.75	534.14	536.52	531.49	524.21	516.57	511.26		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	513.61	511.59	519.09	529.17	529.22	539.66	540.93	542.50	536.23	527.80	518.71	512.50		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0295**	**0.0319**	**0.0441**	**0.0580**	**0.0556**	**0.0754**	**0.0758**	**0.0712**	**0.0635**	**0.0631**	**0.0451**	**0.0234**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	16.81	17.96	24.21	31.44	30.21	40.35	40.57	38.28	34.30	33.97	24.74	13.74		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.01	0.01	0.02	0.04	0.03	0.06	0.06	0.06	0.05	0.04	0.02	0.01		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0368	0.0336	0.0439	0.0619	0.0616	0.0868	0.0909	0.0973	0.0800	0.0605	0.0443	0.0355		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0312	0.0281	0.0348	0.0463	0.0466	0.0607	0.0636	0.0697	0.0589	0.0441	0.0349	0.0310		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0433	0.0400	0.0551	0.0819	0.0806	0.1221	0.1278	0.1338	0.1074	0.0818	0.0558	0.0406		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	512.79	510.47	517.39	526.64	526.49	536.20	537.53	539.51	533.86	526.00	517.64	511.88		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.59	505.98	511.34	518.78	518.94	526.11	527.39	529.94	525.29	517.51	511.46	508.45		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	516.99	514.96	523.44	534.50	534.04	546.29	547.67	549.08	542.43	534.49	523.82	515.31		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9924**	**0.9930**	**0.9909**	**0.9872**	**0.9873**	**0.9822**	**0.9813**	**0.9800**	**0.9835**	**0.9875**	**0.9908**	**0.9926**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0368	0.0336	0.0439	0.0619	0.0616	0.0868	0.0909	0.0973	0.0800	0.0605	0.0443	0.0355		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480	3.9480		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.50**	**0.42**	**0.59**	**0.79**	**0.82**	**1.09**	**1.18**	**1.26**	**1.01**	**0.80**	**0.58**	**0.49**	**9.54**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0368	0.0336	0.0439	0.0619	0.0616	0.0868	0.0909	0.0973	0.0800	0.0605	0.0443	0.0355		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	5,059	4,570	5,059	4,896	5,059	4,896	5,059	5,059	4,896	5,059	4,896	5,059		Specified monthly throughput
N	Annual Turnovers	39.41	39.41	39.41	39.41	39.41	39.41	39.41	39.41	39.41	39.41	39.41	39.41		Calculated Using Equation 1-36
K_N	Turnover Factor	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279	0.9279		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**0.61**	**0.52**	**0.79**	**1.14**	**1.15**	**1.70**	**1.84**	**1.92**	**1.49**	**1.18**	**0.78**	**0.57**	**13.68**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	0.61	0.52	0.79	1.14	1.15	1.70	1.84	1.92	1.49	1.18	0.78	0.57	13.68	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.08	0.07	0.10	0.14	0.14	0.21	0.22	0.23	0.18	0.15	0.10	0.07	1.69	Sum of HAP Component Emissions
L_{TI}	Ethylbenzene Losses (lb/month)	0.01	0.01	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.29	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/month)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.14	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,3) Losses (lb/month)	0.04	0.03	0.05	0.07	0.07	0.11	0.12	0.13	0.10	0.07	0.05	0.03	0.87	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/month)	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.30	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,3,5) Losses (lb/month)	0.02	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.02	0.01	0.36	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/month)	0.06	0.05	0.07	0.11	0.11	0.15	0.17	0.17	0.14	0.11	0.07	0.05	1.26	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank MTK-10162 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**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**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.04	0.03	0.04	0.06	0.06	0.09	0.09	0.10	0.08	0.06	0.04	0.04		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	7	7	7	7	7	7	7	7	7	7	7	7		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**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**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	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 of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	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 of HAP Component Emissions
L_{TI}	Ethylbenzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Isopropyl benzene Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,3) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,2,4) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Trimethylbenzene (1,3,5) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9
L_{TI}	Xylene (m) Losses (lb/hr)	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	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2018
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	7.92	Tank Volume (bbl):	50.00
Net Throughput (bbl/yr):	5,006	Turnovers Per Year:	121.39
Maximum Pumping Rate (bbl/hr):	50.000		
Shell Height (ft):	7.583	Maximum Liquid Height (ft):	5.703
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Dome	Height (ft):	7.92
Radius (ft) (dome Roof):	7.9167		
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_L	Z_V	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sulfuric Acid (99%)**	**January**	**52.11**	**48.63**	**55.59**	**51.78**	**0.00003**	**0.00002**	**0.00004**	**98.08**	**86.08**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.07%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00002	0.00002	80.06	80.06	100.00%	61.93%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**February**	**49.45**	**45.92**	**52.98**	**49.00**	**0.00003**	**0.00002**	**0.00003**	**98.08**	**86.10**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.16%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00001	0.00002	80.06	80.06	100.00%	61.84%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**March**	**55.66**	**51.07**	**60.25**	**54.98**	**0.00004**	**0.00003**	**0.00005**	**98.08**	**86.06**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00002	98.079	98.079	100.00%	37.96%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00003	0.00002	0.00003	80.06	80.06	100.00%	62.04%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**April**	**63.89**	**58.21**	**69.57**	**62.87**	**0.00006**	**0.00004**	**0.00009**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.71%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.29%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**May**	**63.49**	**58.28**	**68.70**	**62.40**	**0.00006**	**0.00004**	**0.00008**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.72%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.28%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**June**	**72.33**	**65.21**	**79.45**	**70.94**	**0.00010**	**0.00007**	**0.00016**	**98.08**	**85.98**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00003	0.00002	0.00005	98.079	98.079	100.00%	37.45%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00007	0.00005	0.00011	80.06	80.06	100.00%	62.55%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**July**	**73.73**	**66.50**	**80.96**	**72.37**	**0.00011**	**0.00007**	**0.00017**	**98.08**	**85.97**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00004	0.00002	0.00006	98.079	98.079	100.00%	37.41%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00008	0.00005	0.00012	80.06	80.06	100.00%	62.59%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**August**	**76.20**	**69.20**	**83.20**	**75.01**	**0.00013**	**0.00009**	**0.00020**	**98.08**	**85.96**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00004	0.00003	0.00006	98.079	98.079	100.00%	37.34%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00009	0.00006	0.00013	80.06	80.06	100.00%	62.66%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**September**	**71.30**	**64.77**	**77.83**	**70.36**	**0.00010**	**0.00007**	**0.00014**	**98.08**	**85.98**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00003	0.00002	0.00005	98.079	98.079	100.00%	37.48%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00007	0.00004	0.00010	80.06	80.06	100.00%	62.52%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**October**	**64.15**	**57.22**	**71.08**	**63.43**	**0.00006**	**0.00004**	**0.00010**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.70%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.30%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**November**	**56.66**	**51.41**	**61.91**	**56.23**	**0.00004**	**0.00003**	**0.00006**	**98.08**	**86.06**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00002	98.079	98.079	100.00%	37.93%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00003	0.00002	0.00004	80.06	80.06	100.00%	62.07%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**December**	**51.45**	**48.56**	**54.34**	**51.20**	**0.00003**	**0.00002**	**0.00003**	**98.08**	**86.08**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.09%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00002	0.00002	80.06	80.06	100.00%	61.91%	Equation 1-25. A = 21.97 and B = 16887.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2018
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[(1)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.0001**	**0.0001**	**0.0002**	**0.0003**	**0.0003**	**0.0007**	**0.0007**	**0.0008**	**0.0006**	**0.0004**	**0.0002**	**0.0001**	**0.0044**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0272	0.0277	0.0356	0.0434	0.0399	0.0536	0.0542	0.0523	0.0492	0.0529	0.0406	0.0226		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63	259.63		Calculated Using Equation 1-3
D	Tank Diameter (ft)	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	5.275	5.275	5.275	5.275	5.275	5.275	5.275	5.275	5.275	5.275	5.275	5.275		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58	7.58		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Dome Roof (ft)**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**	**0.54**		**Calculated Using Equation 1-19**
R_R	Dome Radius (ft)	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92		See 'Tank Identification and Physical Characteristics' table above
R_S	Tank Shell Radius (ft)	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.12	515.33	523.56	523.16	532.00	533.40	535.87	530.97	523.82	516.33	511.12		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.11	509.56	516.01	524.57	524.26	533.38	534.76	537.07	531.92	524.53	516.76	511.37		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0272**	**0.0277**	**0.0356**	**0.0434**	**0.0399**	**0.0536**	**0.0542**	**0.0523**	**0.0492**	**0.0529**	**0.0406**	**0.0226**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.94	14.11	18.37	22.74	20.86	28.49	28.92	28.00	26.13	27.73	20.98	11.56		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0000		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.12	515.33	523.56	523.16	532.00	533.40	535.87	530.97	523.82	516.33	511.12		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.30	505.59	510.74	517.88	517.95	524.88	526.17	528.87	524.44	516.89	511.08	508.23		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.26	512.65	519.92	529.24	528.37	539.12	540.63	542.87	537.50	530.75	521.58	514.01		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745	5.2745		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.0005**	**0.0004**	**0.0006**	**0.0009**	**0.0009**	**0.0015**	**0.0017**	**0.0019**	**0.0014**	**0.0010**	**0.0006**	**0.0004**	**0.0117**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	17,856	16,128	17,856	17,280	17,856	17,280	17,856	17,856	17,280	17,856	17,280	17,856		Specified monthly throughput
N	Annual Turnovers	121.39	121.39	121.39	121.39	121.39	121.39	121.39	121.39	121.39	121.39	121.39	121.39		Calculated Using Equation 1-36
K_N	Turnover Factor	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138	0.4138		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70	5.70		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**0.0006**	**0.0004**	**0.0007**	**0.0012**	**0.0012**	**0.0021**	**0.0024**	**0.0027**	**0.0020**	**0.0014**	**0.0008**	**0.0005**	**0.0162**	**Calculated Using Equation 2-1**
L_T	Total Other Pollutant Losses (lb/month)	0.0006	0.0004	0.0007	0.0012	0.0012	0.0021	0.0024	0.0027	0.0020	0.0014	0.0008	0.0005	0.0162	Sum of Non-VOC Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	0.0006	0.0004	0.0007	0.0012	0.0012	0.0021	0.0024	0.0027	0.0020	0.0014	0.0008	0.0005	0.0162	Sum of Non-Pollutant Component Emissions
L_{TI}	H2SO4 Vapors Over 99% Sulfuric Acid Losses (lb/month)	0.0002	0.0002	0.0003	0.0005	0.0005	0.0008	0.0009	0.0010	0.0007	0.0005	0.0003	0.0002	0.0061	Calculated using Equations 40-1 through 40-9
L_{TI}	SO3 Vapors Over 99% Sulfuric Acid Losses (lb/month)	0.0004	0.0003	0.0005	0.0008	0.0008	0.0013	0.0015	0.0017	0.0012	0.0009	0.0005	0.0003	0.0101	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank S-2018
Location: Martinez Refinery
Type of Tank: Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.00013**	**0.00011**	**0.00016**	**0.00027**	**0.00026**	**0.00044**	**0.00048**	**0.00055**	**0.00041**	**0.00027**	**0.00017**	**0.00013**	**0.00055**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00003	0.00003	0.00004	0.00006	0.00006	0.00010	0.00011	0.00013	0.00010	0.00006	0.00004	0.00003		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.00013**	**0.00011**	**0.00016**	**0.00027**	**0.00026**	**0.00044**	**0.00048**	**0.00055**	**0.00041**	**0.00027**	**0.00017**	**0.00013**	**0.00055**	Calculated Using Equation 2-1
L_{TI}	Total Other Pollutant Losses (lb/hr)	0.00013	0.00011	0.00016	0.00027	0.00026	0.00044	0.00048	0.00055	0.00041	0.00027	0.00017	0.00013	0.00055	Sum of Non-VOC Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	0.00013	0.00011	0.00016	0.00027	0.00026	0.00044	0.00048	0.00055	0.00041	0.00027	0.00017	0.00013	0.00055	Sum of Non-Pollutant Component Emissions
L_{TI}	H2SO4 Vapors Over 99% Sulfuric Acid Losses (lb/hr)	0.00005	0.00004	0.00006	0.00010	0.00010	0.00016	0.00018	0.00020	0.00016	0.00010	0.00007	0.00005	0.00020	Calculated using Equations 40-1 through 40-9
L_{TI}	SO3 Vapors Over 99% Sulfuric Acid Losses (lb/hr)	0.00008	0.00007	0.00010	0.00017	0.00016	0.00027	0.00030	0.00034	0.00026	0.00017	0.00011	0.00008	0.00034	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2023 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	6.00	Tank Volume (bbl):	23.81
Net Throughput (bbl/yr):	250	Turnovers Per Year:	13.33
Maximum Pumping Rate (bbl/hr):	1.286		
Shell Height (ft):	6	Maximum Liquid Height (ft):	4.728
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Dome	Height (ft):	6.00
Radius (ft) (dome Roof):	6		
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2023 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{Vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Heptane (n)	January	52.11	48.61	55.61	51.78	0.4249	0.38066	0.47349	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	February	49.44	45.90	52.98	49.00	0.3908	0.34909	0.43659	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	March	55.65	51.04	60.26	54.98	0.4741	0.41100	0.54515	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	April	63.87	58.17	69.57	62.87	0.6070	0.51194	0.71637	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	May	63.48	58.25	68.71	62.40	0.6000	0.51324	0.69879	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	June	72.31	65.17	79.45	70.94	0.7746	0.63060	0.94509	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	July	73.71	66.46	80.96	72.37	0.8058	0.65487	0.98481	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	August	76.19	69.17	83.21	75.01	0.8637	0.70821	1.04679	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	September	71.29	64.74	77.84	70.36	0.7525	0.62263	0.90424	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	October	64.14	57.18	71.10	63.43	0.6118	0.49678	0.74840	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	November	56.66	51.39	61.93	56.23	0.4890	0.41552	0.57304	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.
Mixture/Product	Heptane (n)	December	51.45	48.55	54.35	51.20	0.4163	0.37989	0.45555	100.20	100.20	--	--	Equation 1-26 (Antoine's equation). A = 6.9, B = 1268.6, C = 216.95.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2023 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.8523**	**0.7179**	**1.2478**	**1.9042**	**1.7831**	**3.0429**	**3.3216**	**3.4528**	**2.7145**	**2.4239**	**1.4240**	**0.6933**	**23.5784**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0077	0.0072	0.0086	0.0108	0.0107	0.0136	0.0141	0.0150	0.0132	0.0109	0.0088	0.0076		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0338	0.0339	0.0452	0.0580	0.0531	0.0762	0.0780	0.0768	0.0695	0.0710	0.0519	0.0280		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	0.9165	0.9227	0.9077	0.8848	0.8860	0.8575	0.8526	0.8437	0.8610	0.8840	0.9051	0.9180		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44	114.44		Calculated Using Equation 1-3
D	Tank Diameter (ft)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	4.048	4.048	4.048	4.048	4.048	4.048	4.048	4.048	4.048	4.048	4.048	4.048		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Dome Roof (ft)**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**	**0.41**		**Calculated Using Equation 1-19**
R_R	Dome Radius (ft)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		See 'Tank Identification and Physical Characteristics' table above
R_S	Tank Shell Radius (ft)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0077**	**0.0072**	**0.0086**	**0.0108**	**0.0107**	**0.0136**	**0.0141**	**0.0150**	**0.0132**	**0.0109**	**0.0088**	**0.0076**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.4249	0.3908	0.4741	0.6070	0.6000	0.7746	0.8058	0.8637	0.7525	0.6118	0.4890	0.4163		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.11	515.32	523.54	523.15	531.98	533.38	535.86	530.96	523.81	516.33	511.12		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.11	509.55	515.99	524.55	524.23	533.35	534.73	537.04	531.90	524.52	516.75	511.36		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0338**	**0.0339**	**0.0452**	**0.0580**	**0.0531**	**0.0762**	**0.0780**	**0.0768**	**0.0695**	**0.0710**	**0.0519**	**0.0280**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	13.99	14.16	18.43	22.80	20.90	28.56	28.99	28.08	26.21	27.84	21.07	11.61		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.09	0.09	0.13	0.20	0.19	0.31	0.33	0.34	0.28	0.25	0.16	0.08		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.4249	0.3908	0.4741	0.6070	0.6000	0.7746	0.8058	0.8637	0.7525	0.6118	0.4890	0.4163		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.3807	0.3491	0.4110	0.5119	0.5132	0.6306	0.6549	0.7082	0.6226	0.4968	0.4155	0.3799		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.4735	0.4366	0.5451	0.7164	0.6988	0.9451	0.9848	1.0468	0.9042	0.7484	0.5730	0.4556		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.11	515.32	523.54	523.15	531.98	533.38	535.86	530.96	523.81	516.33	511.12		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.28	505.57	510.71	517.84	517.93	524.84	526.13	528.84	524.41	516.85	511.06	508.22		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.28	512.65	519.93	529.24	528.38	539.12	540.63	542.88	537.51	530.77	521.60	514.02		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**0.9165**	**0.9227**	**0.9077**	**0.8848**	**0.8860**	**0.8575**	**0.8526**	**0.8437**	**0.8610**	**0.8840**	**0.9051**	**0.9180**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.4249	0.3908	0.4741	0.6070	0.6000	0.7746	0.8058	0.8637	0.7525	0.6118	0.4890	0.4163		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475	4.0475		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.9246**	**0.7719**	**1.0238**	**1.2478**	**1.2754**	**1.5661**	**1.6792**	**1.7922**	**1.5256**	**1.2997**	**1.0204**	**0.9071**	**15.0338**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.4249	0.3908	0.4741	0.6070	0.6000	0.7746	0.8058	0.8637	0.7525	0.6118	0.4890	0.4163		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	893	806	893	864	893	864	893	893	864	893	864	893		Specified monthly throughput
N	Annual Turnovers	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**1.777**	**1.490**	**2.272**	**3.152**	**3.058**	**4.609**	**5.001**	**5.245**	**4.240**	**3.724**	**2.444**	**1.600**	**38.612**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	1.777	1.490	2.272	3.152	3.058	4.609	5.001	5.245	4.240	3.724	2.444	1.600	38.612	Sum of VOC Component Emissions
L_{TI}	Heptane (n) Losses (lb/month)	1.777	1.490	2.272	3.152	3.058	4.609	5.001	5.245	4.240	3.724	2.444	1.600	38.612	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2023 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.05597**	**0.05174**	**0.06201**	**0.07815**	**0.07731**	**0.09814**	**0.10183**	**0.10865**	**0.09553**	**0.07873**	**0.06383**	**0.05490**	**0.10865**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20	100.20		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.42494	0.39078	0.47409	0.60696	0.60002	0.77459	0.80582	0.86373	0.75248	0.61181	0.48896	0.41627		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	54	54	54	54	54	54	54	54	54	54	54	54		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.056**	**0.052**	**0.062**	**0.078**	**0.077**	**0.098**	**0.102**	**0.109**	**0.096**	**0.079**	**0.064**	**0.055**	**0.109**	Calculated Using Equation 2-1
L_{TJ}	Total VOC Losses (lb/hr)	0.056	0.052	0.062	0.078	0.077	0.098	0.102	0.109	0.096	0.079	0.064	0.055	0.109	Sum of VOC Component Emissions
L_{TJ}	Heptane (n) Losses (lb/hr)	0.056	0.052	0.062	0.078	0.077	0.098	0.102	0.109	0.096	0.079	0.064	0.055	0.109	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2024
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	8.50	Tank Volume (bbl):	71.45
Net Throughput (bbl/yr):	834	Turnovers Per Year:	13.60
Maximum Pumping Rate (bbl/hr):	71.450		
Shell Height (ft):	8.8333	Maximum Liquid Height (ft):	7.07
Is Tank Underground (y / n)	No		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New

Fixed Roof Characteristics

Type:	Dome	Height (ft):	8.50
Radius (ft) (dome Roof):	8.5		
Fixed Roof Paint Color/Shade:	White	Fixed Roof Paint Condition:	New

Breather Vent Settings

Vacuum Settings (psig):	None	Pressure Settings (psig):	None

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Sulfuric Acid (99%)**	**January**	**52.11**	**48.60**	**55.62**	**51.78**	**0.00003**	**0.00002**	**0.00004**	**98.08**	**86.08**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.07%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00002	0.00002	80.06	80.06	100.00%	61.93%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**February**	**49.44**	**45.89**	**52.99**	**49.00**	**0.00003**	**0.00002**	**0.00003**	**98.08**	**86.10**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.16%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00001	0.00002	80.06	80.06	100.00%	61.84%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**March**	**55.65**	**51.03**	**60.27**	**54.98**	**0.00004**	**0.00003**	**0.00005**	**98.08**	**86.06**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00002	98.079	98.079	100.00%	37.96%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00002	0.00003	80.06	80.06	100.00%	62.04%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**April**	**63.86**	**58.15**	**69.57**	**62.87**	**0.00006**	**0.00004**	**0.00009**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.71%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.29%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**May**	**63.47**	**58.24**	**68.70**	**62.40**	**0.00006**	**0.00004**	**0.00008**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.72%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.28%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**June**	**72.30**	**65.15**	**79.45**	**70.94**	**0.00010**	**0.00007**	**0.00016**	**98.08**	**85.98**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00003	0.00002	0.00005	98.079	98.079	100.00%	37.45%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00007	0.00005	0.00011	80.06	80.06	100.00%	62.55%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**July**	**73.70**	**66.44**	**80.96**	**72.37**	**0.00011**	**0.00007**	**0.00017**	**98.08**	**85.97**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00004	0.00002	0.00006	98.079	98.079	100.00%	37.41%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00008	0.00005	0.00012	80.06	80.06	100.00%	62.59%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**August**	**76.18**	**69.14**	**83.22**	**75.01**	**0.00013**	**0.00009**	**0.00020**	**98.08**	**85.96**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00004	0.00003	0.00006	98.079	98.079	100.00%	37.34%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00009	0.00006	0.00013	80.06	80.06	100.00%	62.66%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**September**	**71.28**	**64.71**	**77.85**	**70.36**	**0.00010**	**0.00007**	**0.00014**	**98.08**	**85.98**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00003	0.00002	0.00005	98.079	98.079	100.00%	37.48%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00007	0.00004	0.00010	80.06	80.06	100.00%	62.52%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**October**	**64.13**	**57.15**	**71.11**	**63.43**	**0.00006**	**0.00004**	**0.00010**	**98.08**	**86.02**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00002	0.00001	0.00003	98.079	98.079	100.00%	37.70%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00004	0.00003	0.00006	80.06	80.06	100.00%	62.30%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**November**	**56.65**	**51.36**	**61.94**	**56.23**	**0.00004**	**0.00003**	**0.00006**	**98.08**	**86.06**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00002	98.079	98.079	100.00%	37.93%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00003	0.00002	0.00004	80.06	80.06	100.00%	62.07%	Equation 1-25. A = 21.97 and B = 16887.11.
Mixture/Product	**Sulfuric Acid (99%)**	**December**	**51.45**	**48.54**	**54.36**	**51.20**	**0.00003**	**0.00002**	**0.00003**	**98.08**	**86.08**	--	--	**Sum of partial pressures of individual components listed below.**
	H2SO4 Vapors Over 99% Sulfur						0.00001	0.00001	0.00001	98.079	98.079	100.00%	38.09%	Equation 1-25. A = 20.79 and B = 16532.7.
	SO3 Vapors Over 99% Sulfuric A						0.00002	0.00002	0.00002	80.06	80.06	100.00%	61.91%	Equation 1-25. A = 21.97 and B = 16887.11.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2024
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_S	**Standing Losses (lb)**	**0.0001**	**0.0001**	**0.0002**	**0.0004**	**0.0004**	**0.0008**	**0.0010**	**0.0011**	**0.0007**	**0.0005**	**0.0003**	**0.0001**	**0.0057**	Calculated Using Equation 1-2
V_V	Vapor Space Volume (ft^3)	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74		Calculated Using Equation 1-3
W_V	Vapor Density (lb/ft^3)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		Calculated Using Equation 1-22
K_E	Vapor Space Expansion Factor	0.0274	0.0279	0.0359	0.0436	0.0400	0.0538	0.0545	0.0525	0.0495	0.0533	0.0410	0.0228		Calculated Using Equation 1-5
K_S	Vented Vapor Saturation Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Calculated Using equation 1-21
V_V	**Tank Vapor Space Volume (ft^3)**	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74	333.74		Calculated Using Equation 1-3
D	Tank Diameter (ft)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50		See 'Tank Identification and Physical Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881		Calculated Using Equation 1-16
H_S	Tank Shell Height (ft)	8.83	8.83	8.83	8.83	8.83	8.83	8.83	8.83	8.83	8.83	8.83	8.83		See 'Tank Identification and Physical Characteristics' table above
H_L	Average Liquid Height (ft)	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54		See 'Tank Identification and Physical Characteristics' table above
H_{RO}	Roof Outage (ft)	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58		Calculated Using Equation 1-17 or 1-19
H_{RO}	**Roof Outage - Dome Roof (ft)**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**		**Calculated Using Equation 1-19**
R_R	Dome Radius (ft)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50		See 'Tank Identification and Physical Characteristics' table above
R_S	Tank Shell Radius (ft)	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25		See 'Tank Identification and Physical Characteristics' table above
W_V	**Vapor Density (lb/ft^3)**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**Calculated Using Equation 1-22**
M_V	Vapor Molecular Weight (lb/lbmol)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.11	515.32	523.53	523.14	531.97	533.37	535.85	530.95	523.80	516.32	511.12		Calculated Using Equation 1-27
ΔT_A	Daily Average Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
R	Ideal Gas Constant R ($psia-ft^3$)/(lbmol-°R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Per AP-42 Chapter 7.1
T_B	Liquid Bulk Temperature (°R)	511.45	508.67	514.65	522.54	522.07	530.61	532.04	534.68	530.03	523.10	515.90	510.87		Calculated Using Equation 1-31
T_V	Average Vapor Temperature (°R)	512.10	509.54	515.98	524.53	524.21	533.32	534.70	537.01	531.88	524.50	516.74	511.36		Calculated Using Equation 1-32
α_S	Tank Shell Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
α_R	Tank Roof Paint Solar Absorptance	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		From Table 7.1-6
I	Daily Total Solar Insolation Factor (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00		From Table 7.1-7
K_E	**Vapor Space Expansion Factor**	**0.0274**	**0.0279**	**0.0359**	**0.0436**	**0.0400**	**0.0538**	**0.0545**	**0.0525**	**0.0495**	**0.0533**	**0.0410**	**0.0228**		**Calculated Using Equation 1-5**
ΔT_V	Daily Vapor Temperature Range (°R)	14.04	14.20	18.48	22.85	20.94	28.62	29.05	28.15	26.29	27.93	21.15	11.65		Calculated Using Equation 1-6
ΔP_V	Daily Vapor Pressure Range (psia)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Calculated Using Equation 1-9
ΔP_B	Breather Vent Pressure Setting Range (psia)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-10
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
P_{VN}	Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
P_{VX}	Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0000	0.0000	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0000		See 'Stored Liquid Characteristics' table above
T_{LA}	Daily Average Liquid Surface Temperature (°R)	511.78	509.11	515.32	523.53	523.14	531.97	533.37	535.85	530.95	523.80	516.32	511.12		Calculated Using Equation 1-27
T_{LN}	Daily Minimum Liquid Surface Temperature (°R)	508.27	505.56	510.70	517.82	517.91	524.82	526.11	528.81	524.38	516.82	511.03	508.21		Calculated Using Figure 7-1.17
T_{LX}	Daily Maximum Liquid Surface Temperature (°R)	515.29	512.66	519.94	529.24	528.37	539.12	540.63	542.89	537.52	530.78	521.61	514.03		Calculated Using Figure 7-1.17
ΔT_A	Daily Ambient Temperature Range (°R)	15.10	14.50	18.20	21.30	18.40	25.90	26.60	26.60	26.00	29.60	23.20	12.70		Calculated Using Equation 1-11
K_S	**Vented Vapor Saturation Factor**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**		**Calculated Using Equation 1-21**
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
H_{VO}	Vapor Space Outage (ft)	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813	5.8813		Calculated Using Equation 1-16
L_W	**Working Losses (lb/month)**	**0.0002**	**0.0001**	**0.0002**	**0.0004**	**0.0004**	**0.0006**	**0.0007**	**0.0008**	**0.0006**	**0.0004**	**0.0002**	**0.0002**	**0.0047**	**Calculated Using Equation 1-35**
M_V	Vapor Molecular Weight (lb/lbmol)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Avg. Liquid Surface Temp. (psia)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000		See 'Stored Liquid Characteristics' table above
Q	Throughput (gal/month)	2,976	2,688	2,976	2,880	2,976	2,880	2,976	2,976	2,880	2,976	2,880	2,976		Specified monthly throughput
N	Annual Turnovers	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60	13.60		Calculated Using Equation 1-36
K_N	Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		Per notes to Equation 1-35
H_{LX}	Maximum Liquid Height (ft)	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07	7.07		See 'Tank Identification and Physical Characteristics' table above
D	Tank Diameter (ft)	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50		See 'Tank Identification and Physical Characteristics' table above
K_P	Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 1-35
K_B	Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Calculated using equations 1-40 and 1-41
L_T	**Total Losses (lb/month)**	**0.0003**	**0.0002**	**0.0004**	**0.0008**	**0.0008**	**0.0014**	**0.0016**	**0.0018**	**0.0013**	**0.0009**	**0.0005**	**0.0003**	**0.0104**	**Calculated Using Equation 2-1**
L_T	Total Other Pollutant Losses (lb/month)	0.0003	0.0002	0.0004	0.0008	0.0008	0.0014	0.0016	0.0018	0.0013	0.0009	0.0005	0.0003	0.0104	Sum of Non-VOC Component Emissions
L_T	Total Non-Pollutant Losses (lb/month)	0.0003	0.0002	0.0004	0.0008	0.0008	0.0014	0.0016	0.0018	0.0013	0.0009	0.0005	0.0003	0.0104	Sum of Non-Pollutant Component Emissions
L_{TI}	H2SO4 Vapors Over 99% Sulfuric Acid Losses (lb/month)	0.0001	0.0001	0.0002	0.0003	0.0003	0.0005	0.0006	0.0007	0.0005	0.0003	0.0002	0.0001	0.0039	Calculated using Equations 40-1 through 40-9
L_{TI}	SO3 Vapors Over 99% Sulfuric Acid Losses (lb/month)	0.0002	0.0002	0.0003	0.0005	0.0005	0.0009	0.0010	0.0011	0.0008	0.0006	0.0003	0.0002	0.0065	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.2 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank S-2024
Location:	Martinez Refinery
Type of Tank:	Vertical Fixed Roof Tank

Maximum Hourly Emissions Report[(2)]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_{MAX}	**Maximum Hourly Emissions (lb/hr)**	**0.00019**	**0.00016**	**0.00023**	**0.00038**	**0.00037**	**0.00063**	**0.00068**	**0.00078**	**0.00059**	**0.00039**	**0.00025**	**0.00018**	**0.00078**	TCEQ APDG 6250 - Equation 1
M_V	Vapor Molecular Weight (lb/lb-mole)	86.08	86.10	86.06	86.02	86.02	85.98	85.97	85.96	85.98	86.02	86.06	86.08		See 'Stored Liquid Characteristics' table above
P_{VA}	Vapor Pressure at Daily Average Liquid Surface temperature (psia)	0.00003	0.00003	0.00004	0.00006	0.00006	0.00010	0.00011	0.00013	0.00010	0.00006	0.00004	0.00003		See 'Stored Liquid Characteristics' table above
R	Ideal Gas Constant R (psia-ft^3/lbmol-°R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731		Constant
T_{LA}	Daily Average Liquid Surface Temperature (°R)	--	--	--	--	--	--	--	--	--	--	--	--		Calculated Using Equation 1-27
FR_M	Maximum Filling Rate for Tank (gal/hr)	3,001	3,001	3,001	3,001	3,001	3,001	3,001	3,001	3,001	3,001	3,001	3,001		See 'Tank Identification and Physical Characteristics' table above
L_T	**Total Losses (lb/hr)**	**0.00019**	**0.00016**	**0.00023**	**0.00038**	**0.00037**	**0.00063**	**0.00068**	**0.00078**	**0.00059**	**0.00039**	**0.00025**	**0.00018**	**0.00078**	Calculated Using Equation 2-1
L_{TI}	Total Other Pollutant Losses (lb/hr)	0.00019	0.00016	0.00023	0.00038	0.00037	0.00063	0.00068	0.00078	0.00059	0.00039	0.00025	0.00018	0.00078	Sum of Non-VOC Component Emissions
L_{TI}	Total Non-Pollutant Losses (lb/hr)	0.00019	0.00016	0.00023	0.00038	0.00037	0.00063	0.00068	0.00078	0.00059	0.00039	0.00025	0.00018	0.00078	Sum of Non-Pollutant Component Emissions
L_{TI}	H2SO4 Vapors Over 99% Sulfuric Acid Losses (lb/hr)	0.00007	0.00006	0.00009	0.00014	0.00014	0.00023	0.00025	0.00029	0.00022	0.00015	0.00009	0.00007	0.00029	Calculated using Equations 40-1 through 40-9
L_{TI}	SO3 Vapors Over 99% Sulfuric Acid Losses (lb/hr)	0.00012	0.00010	0.00015	0.00024	0.00023	0.00039	0.00043	0.00049	0.00037	0.00024	0.00015	0.00011	0.00049	Calculated using Equations 40-1 through 40-9

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-19 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	117.00	Tank Volume (bbl):	62,000.00
Net Throughput (bbl/yr):	14,016,000	Turnovers Per Year:	249.12
Maximum Pumping Rate (bbl/hr):	8,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	Renewable Diesel	January	52.61	--	--	52.35	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.13%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	February	50.11	--	--	49.77	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.12%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	March	56.68	--	--	56.15	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	April	65.41	--	--	64.62	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	May	65.13	--	--	64.28	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	June	74.40	--	--	73.32	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.29%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	July	75.77	--	--	74.71	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.31%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	August	77.99	--	--	77.06	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.33%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	September	72.73	--	--	71.99	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.27%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	October	65.22	--	--	64.66	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	November	57.31	--	--	56.97	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.16%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	Renewable Diesel	December	51.82	--	--	51.63	0.0400	--	--	188.00	130.00	--	--	Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.13%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-19 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**2.252**	**2.590**	**2.474**	**2.805**	**3.524**	**3.074**	**3.155**	**3.138**	**2.754**	**2.284**	**2.016**	**2.108**	**32.174**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**8.606**	**11.043**	**9.864**	**12.022**	**16.493**	**13.729**	**14.050**	**13.937**	**11.706**	**8.782**	**7.436**	**7.816**	**135.483**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	1,146.23	1,628.47	1,313.82	1,654.63	2,196.76	1,889.56	1,871.39	1,856.29	1,611.10	1,169.74	1,023.44	1,041.07		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**94.985**	**85.793**	**94.985**	**91.921**	**94.985**	**91.921**	**94.985**	**94.985**	**91.921**	**94.985**	**91.921**	**94.985**	**1,118.369**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	1,190,400	1,075,200	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	117	117	117	117	117	117	117	117	117	117	117	117		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**105.843**	**99.425**	**107.322**	**106.748**	**115.002**	**108.723**	**112.190**	**112.059**	**106.381**	**106.051**	**101.373**	**104.909**	**1,286.026**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	105.843	99.425	107.322	106.748	115.002	108.723	112.190	112.059	106.381	106.051	101.373	104.909	1,286.026	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.109	0.102	0.114	0.123	0.137	0.141	0.148	0.151	0.132	0.118	0.107	0.108	1.489	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	0.1091	0.1019	0.1138	0.1233	0.1369	0.1409	0.1476	0.1514	0.1317	0.1182	0.1067	0.1075	1.4889	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-19 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.653**	**0.659**	**0.655**	**0.659**	**0.665**	**0.662**	**0.661**	**0.661**	**0.658**	**0.653**	**0.651**	**0.652**	**0.665**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.003**	**0.004**	**0.003**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.003**	**0.003**	**0.003**	**0.005**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.012**	**0.016**	**0.013**	**0.017**	**0.022**	**0.019**	**0.019**	**0.019**	**0.016**	**0.012**	**0.010**	**0.011**	**0.022**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.653**	**0.659**	**0.655**	**0.659**	**0.665**	**0.662**	**0.661**	**0.661**	**0.658**	**0.653**	**0.651**	**0.652**	**0.665**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.653	0.659	0.655	0.659	0.665	0.662	0.661	0.661	0.658	0.653	0.651	0.652	0.665	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00066	0.00066	0.00066	0.00068	0.00069	0.00071	0.00071	0.00071	0.00069	0.00067	0.00066	0.00066	0.00071	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31	150	1.4	1
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14	5.4	1.1	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	19
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.82	0.53	0.14	24
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification

Tank Number:	Tank B-21 (Post-Project PTE)
Location:	Martinez Refinery
Type of Tank:	External Floating Roof Tank

Physical Characteristics

Tank Dimensions, Throughput, and Temperature Profile

Diameter (ft):	117.00	Tank Volume (bbl):	62,000.00
Net Throughput (bbl/yr):	14,016,000	Turnovers Per Year:	249.12
Maximum Pumping Rate (bbl/hr):	8,000.000		
Tank Temperature Profile:	Ambient	Tank Insulation Type:	No Insulation

Shell Characteristics

Shell Paint Color/Shade:	White	Shell Paint Condition:	New
Internal Shell Condition:	Light Rust		

Floating Roof Characteristics

Construction:	Welded	Type:	Steel Pontoon
Floating Roof Paint Color/Shade:	White	Floating Roof Paint Condition:	New

Tank Construction and Rim-Seal System

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

Meteorological Data

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Avg.	Notes
T_{AA}	Ambient Daily Maximum Temperature (°F)	59.00	55.80	63.40	72.50	70.50	82.50	84.30	87.10	82.40	77.50	67.40	57.30	71.64	Met Data Used in 2019 Emission Inventory Calcs
T_{AN}	Ambient Daily Minimum Temperature (°F)	43.90	41.30	45.20	51.20	52.10	56.60	57.70	60.50	56.40	47.90	44.20	44.60	50.13	Met Data Used in 2019 Emission Inventory Calcs
T_{AX}	Ambient Daily Average Temperature (°F)	51.45	48.55	54.30	61.85	61.30	69.55	71.00	73.80	69.40	62.70	55.80	50.95	60.89	Met Data Used in 2019 Emission Inventory Calcs
v	Monthly Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00	6.78	Met Data Used in 2019 Emission Inventory Calcs
P_A	Atmospheric Pressure (psia)	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	14.73	Met Data Used in 2019 Emission Inventory Calcs
I	Monthly Solar Insolation (Btu/ft^2-day)	653.00	882.00	1,340.00	2,005.00	2,160.00	2,735.00	2,687.00	2,365.00	1,875.00	1,423.00	850.00	493.00	1,622.33	Met Data Used in 2019 Emission Inventory Calcs

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Stored Liquid Characteristics[1]

i			T_{LA}	T_{LN}	T_{LX}	T_B	P_{VA}	P_{VN}	P_{VX}	M_L	M_V	Z_{Li}	Z_{vi}	
Component	Stored Product or Component in Mixture	Month	Average liquid surface temperature (°F)	Average minimum liquid surface temperature (°F)	Average maximum liquid surface temperature (°F)	Liquid Bulk Temperature for Use in Calculations (°F)	True vapor pressure at T_{LA} (psia)	True vapor pressure at T_{LN} (psia)	True vapor pressure at T_{LX} (psia)	Liquid Molecular Weight (lb/lbmol)	Vapor Molecular Weight (lb/lbmol)	Liquid Wt. Percent of Components Within Liquid	Vapor Weight Percent Eq. 40-6	Basis for Vapor Pressure Calculations. Component vapor pressures shown are partial pressures as determined using the vapor pressure methodology shown, the liquid mole fraction as determined by Eq. 40-4, and Eq. 40-3.
Mixture/Product	**Renewable Diesel**	**January**	**52.61**	--	--	**52.35**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.13%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**February**	**50.11**	--	--	**49.77**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.12%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**March**	**56.68**	--	--	**56.15**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.15%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**April**	**65.41**	--	--	**64.62**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**May**	**65.13**	--	--	**64.28**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**June**	**74.40**	--	--	**73.32**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.29%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**July**	**75.77**	--	--	**74.71**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.31%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**August**	**77.99**	--	--	**77.06**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.33%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**September**	**72.73**	--	--	**71.99**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.27%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**October**	**65.22**	--	--	**64.66**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.21%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**November**	**57.31**	--	--	**56.97**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.16%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.
Mixture/Product	**Renewable Diesel**	**December**	**51.82**	--	--	**51.63**	**0.0400**	--	--	**188.00**	**130.00**	--	--	**Site-specific VPCRx data collected using ASTM D6377, best fit to a 2nd order polynomial equation. A = 0, B = 0, C = 0.27.**
	Isopropyl benzene						0.0001	--	--	120.19	120.19	0.10%	0.13%	Equation 1-26 (Antoine's equation). A = 6.92, B = 1455.8, C = 207.2.

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Monthly Total Emissions Report[1]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total	Notes
L_R	**Rim Seal Losses (lb/month)**	**2.252**	**2.590**	**2.474**	**2.805**	**3.524**	**3.074**	**3.155**	**3.138**	**2.754**	**2.284**	**2.016**	**2.108**	**32.174**	Calculated Using Equation 2-3
K_{Ra}	Seal Factor A (lbmol/ft-yr)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor from Table 7.1-8 based on seal type specified above
K_{Rb}	Seal Factor B (lbmol/ft-yr (mph)^n)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
v	Average Wind Speed (mph)	5.4	7.2	6.0	7.3	9.0	8.0	8.0	7.9	7.1	5.5	4.9	5.0		From 'Met Data Entry' Tab
n	Seal-related Wind Speed Exponent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		Factor for mechanical shoe primary and rim-mounted secondary seal from Table 7.1-8
P*	Value of Vapor Pressure Function	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007		Calculated Using Equation 2-4
P_{VA}	Vapor Pressure at T_{LA} (psia)	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Tank Identification and Physical Characteristics' table above
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
L_F	**Deck Fitting Losses (lb/month)**	**8.606**	**11.043**	**9.864**	**12.022**	**16.493**	**13.729**	**14.050**	**13.937**	**11.706**	**8.782**	**7.436**	**7.816**	**135.483**	Calculated Using Equation 2-13
P*	Value of Vapor Pressure Function	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007		Calculated Using Equation 2-4
M_V	Vapor Molecular Weight (lb/lbmol)	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00		See 'Stored Liquid Characteristics' table above
K_C	Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		Per notes to Equation 2-3
F_F	Total Deck Fitting Loss Factor (lbmol/month)	1,146.23	1,628.47	1,313.82	1,654.63	2,196.76	1,889.56	1,871.39	1,856.29	1,611.10	1,169.74	1,023.44	1,041.07		Calculated Using Equation 2-14
v	Average Wind Speed (mph)	5.41	7.16	6.04	7.25	9.03	8.04	7.98	7.93	7.10	5.50	4.93	5.00		From 'Met Data Entry' Tab
L_D	**Deck Seam Losses (lb/month)**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Welded floating roofs do not have deck seam losses**
L_{WD}	**Withdrawal Losses (lb/month)**	**94.985**	**85.793**	**94.985**	**91.921**	**94.985**	**91.921**	**94.985**	**94.985**	**91.921**	**94.985**	**91.921**	**94.985**	**1,118.369**	Calculated using Equation 2-19
Q	Throughput (bbl/month)	1,190,400	1,075,200	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400	1,190,400	1,152,000	1,190,400	1,152,000	1,190,400		Specified monthly throughput
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015		From Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		From Chemical Properties Database
D	Tank Diameter (ft)	117	117	117	117	117	117	117	117	117	117	117	117		See 'Stored Liquid Characteristics' table above
L_T	**Total Losses (lb/month)**	**105.843**	**99.425**	**107.322**	**106.748**	**115.002**	**108.723**	**112.190**	**112.059**	**106.381**	**106.051**	**101.373**	**104.909**	**1,286.026**	**Calculated Using Equation 2-1**
L_T	Total VOC Losses (lb/month)	105.843	99.425	107.322	106.748	115.002	108.723	112.190	112.059	106.381	106.051	101.373	104.909	1,286.026	Sum of VOC Component Emissions
L_T	Total HAP Losses (lb/month)	0.109	0.102	0.114	0.123	0.137	0.141	0.148	0.151	0.132	0.118	0.107	0.108	1.489	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/month)	0.1091	0.1019	0.1138	0.1233	0.1369	0.1409	0.1476	0.1514	0.1317	0.1182	0.1067	0.1075	1.4889	Calculated using Equations 40-1 through 40-9

Martinez Renewable Fuels Project
Appendix B - Emission Calculations
Section 4.3 - Post-Project Storage Tank PTE, Detailed Storage Tank Emission Calculations

Tank Identification

Identification
Tank Number: Tank B-21 (Post-Project PTE)
Location: Martinez Refinery
Type of Tank: External Floating Roof Tank

Maximum Hourly Emissions Report[2]

	Month	January	February	March	April	May	June	July	August	September	October	November	December	Max Month	Notes
L_T	**Total Loss (lb/hr)**	**0.653**	**0.659**	**0.655**	**0.659**	**0.665**	**0.662**	**0.661**	**0.661**	**0.658**	**0.653**	**0.651**	**0.652**	**0.665**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 1 scaled to lb/hr
L_{WD}	**Withdrawal Loss (lb/hr)**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	**0.638**	TCEQ Air Permit Reviewer Guide (APDG) 6419 Equation 3 scaled to lb/hr
Q_{MAX}	Maximum Throughput (bbl/hr)	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48	190.48		See 'Tank Identification and Physical Characteristics' table above
C_S	Shell Clingage Factor (bbl/1,000 ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		Values from Table 7.1-10
W_L	Average Organic Liquid Density (lb/gal)	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60		See 'Stored Liquid Characteristics' table above
D	Tank Diameter (ft)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00		See 'Stored Liquid Characteristics' table above
L_R	**Rim Seal Loss (lb/hr)**	**0.003**	**0.004**	**0.003**	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.004**	**0.003**	**0.003**	**0.003**	**0.005**	Monthly Rim Seal Loss calculated above divided by hours per month, per TCEQ Air Permit Reviewer Guide (APDG) 6419.
L_F	**Deck Fitting Loss (lb/hr)**	**0.012**	**0.016**	**0.013**	**0.017**	**0.022**	**0.019**	**0.019**	**0.019**	**0.016**	**0.012**	**0.010**	**0.011**	**0.022**	Monthly Deck Fitting Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_D	**Deck Seam Loss (lb/hr)**	--	--	--	--	--	--	--	--	--	--	--	--	--	Monthly Deck Seam Loss calculated above divided by hours per month, per TCEQ APDG 6419.
L_T	**Total Losses (lb/hr)**	**0.653**	**0.659**	**0.655**	**0.659**	**0.665**	**0.662**	**0.661**	**0.661**	**0.658**	**0.653**	**0.651**	**0.652**	**0.665**	Calculated Using Equation 2-1
L_{TI}	Total VOC Losses (lb/hr)	0.653	0.659	0.655	0.659	0.665	0.662	0.661	0.661	0.658	0.653	0.651	0.652	0.665	Sum of VOC Component Emissions
L_{TI}	Total HAP Losses (lb/hr)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	Sum of HAP Component Emissions
L_{TI}	Isopropyl benzene Losses (lb/hr)	0.00066	0.00066	0.00066	0.00068	0.00069	0.00071	0.00071	0.00071	0.00069	0.00067	0.00066	0.00066	0.00071	Calculated using Equations 40-1 through 40-9

	Deck Fitting Loss Factors Per Table 7.1-12[1]			Quantity of Fittings
Roof Fitting/Status	K_{Fa} (lbmol/yr)	K_{Fb} (lbmol/yr-mph)	m	N_F
Access Hatch, Bolted Cover, Gasketed	1.6	-	-	1
Unslotted Guide-Pole Well, Ungasketed Sliding Cover	31	150	1.4	1
Automatic Gauge Float Well, Unbolted Cover, Ungasketed	14	5.4	1.1	1
Gauge-Hatch/Sample Well, Weighted Mech. Actuation, Gask.	0.47	0.02	0.97	1
Vacuum Breaker, Weighted Mech. Actuation, Gask.	6.2	1.2	0.94	1
Deck Leg, EFR-Type (Pontoon area of pontoon roofs, total sleeve length approx. 30 in.), Adjustable, Ungasketed	2	0.37	0.91	19
Deck Leg, EFR-Type (Double-deck roof and center area of pontoon roofs, total sleeve length approx. 48 in.), Adjustable	0.82	0.53	0.14	24
Rim Vent, Weighted Mechanical Actuation, Gasketed	0.71	0.1	1	1

Notes:
(1) Equations, figures, and tables are from AP-42 Chapter 7.1 Organic Liquid Storage Tanks, June 2020.
(2) Calculations follow the methodology specified in TCEQ Air Permit Reviewer Guides (APDG) 6250 and 6419. Notes in this table which do not begin with 'TCEQ APDG' are to the AP-42 referenced in footnote (1).